DECISION MAKING IN LIFE CYCLE COSTING

by

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Abstract

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There has been increasing demand by clients the construction industry to understand the Life Cycle Costs (LCC) of their projects. This report establishes that the formation of LCC forecasts requires decision-making by the LCC consultants where not all information is available, or all of the variables known. The LCC consultant is required to make rational decisions based on professional judgement. The appliance of various theories is discussed and it is established that Behavioural Theory, rather than Preference Theory, can be better used to understand the decisions make by the LCC consultant. Inherent to decision-making is the perception of risk. The application of Behavioural Theory requires risk to be assessed in a non-quantitative manner. There are difficulties both for the LCC consultant in methodically analysing the risk and to the client in understanding where that risk exists in the LCC forecast.

In order to provide a greater understanding of where the risk exists in the LCC forecast this report analysis each of those variables which requires decision-making by the LCC Consultant. The sensitivity of the forecast to changes in the LCC forecast is undertaken in the context of total 'real' cost and net present value. The study found the LCC forecast was sensitive to the following variables in descending order; Component Life, Sub-Component Life, Quantity of Replacement, Uplift Cost. This proves the reports hypothesis, which was that the Component Life and Sub-Component Life were most sensitive, correct. Recommendations are that this analysis is applied to a wider range of building types, that LCC consultants gain awareness of the risks associated with decision making, and that there be a case study using emerging decision-making techniques in LCC.

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INTRODUCTION AND REPORT STRUCTURE

This dissertation forms the final submission of the candidate following the completion of a part time Masters of Science in Construction Economics and Management whilst also working as a junior Whole Life Cost consultant. When the topic for this report was being developed the candidate wished to incorporate both of these roles, and subject areas. The joint application of these areas was thought to have particular benefit to industry due to the growing focus of the private sector on the Whole Life Costing (WLC) of construction projects, and the requirement of Life Cycle Costing (LCC) within the increasing number of public sector Private Finance Initiatives (PFI) projects.

The subject area that this report is focused on is LCC forecasts. The definition of Life Cycle Costing has varied considerably, this report is, where possible, going to use definitions from the ISO 15686-1-200 Building and Constructed Assets, which seeks to standardise the language and techniques used in the industry. The ISO definition of LCC is *"A tool and technique which enables competitive cost assessments to be made over a specified period of time, taking into account all relevant economic factors both in terms of initial capital costs and future operational and asset replacement costs, through to end of life, or end of interest in the asset – also taking into account any other non construction costs and income, defined in the scope".*

This report seeks to focus on the costs of asset replacement involved in the above description of LCC. The candidate has been involved in the creation of numerous forecasts of asset replacement for clients across various sectors, throughout the creation of these there are assumptions made by the WLC consultant. Because these are assumptions they are subject to the risk involved in personal decision-making risk and personal bias of the consultant.

It is good practice for the WLC consultant, when providing a forecast to the client, to advise the client of the risks inherent to the model. Increased awareness of these risks will help the consultant to better inform the client, and help the client to manage that risk.

The report aims to link the sensitivity of the asset replacement calculations, and resultant forecast, to the assumptions made by the consultant that are subjective to personal bias and personal risk perception. Through this assessment of sensitivity the report both illustrates whether the forecast is, or not, subject to personal risk perception as well as being able to identify the magnitude of this risk and what assumptions the forecast is most sensitive to. A ranking of the sensitivity of assumption made in the asset replacement forecast will help to focus future research as well as provide a basis on which to better advise clients of where the risks exist in the forecast.

The report starts with a hypothesis, wherein a brief context in which the report sits is given, the report problem outlined and the hypothesis stated. The reasoning for the hypothesis is given as an overview, though this is explored further in the literature review.

Following the hypothesis the literature review develops the theoretical context of the report, reviewing literature, journals and industry discussion. This section of the report also sets the definitions of the terms that will be used throughout the report; these terms themselves are also a subject of industry discussion. The literature to be reviewed falls under two main topic areas, WLC, and personal perception of risk and personal bias.

The literature surrounding the theory and development of LCC as a part of WLC in line with the requirement of this information for an increasing number of private clients, as well as a requirement of the PFI, will be reviewed. The other key areas of review are of the techniques used to calculate the LCC, with focus on the asset replacement forecast, as well as

discussion around the risks that are inherent to this process and the risk management processes that are in place in order to mitigate that risk.

The discussion regarding the risk associated with LCC overlaps with the second main topic area covered in the literature review– personal perceptions of risk and personal bias. The hypothesis of this report predicts that these affect the asset replacement forecast. The review of literature surrounding this includes construction, project management, risk management and psychology literature. Discussion of this topic area includes the personal perceptions of risk and personal bias; the contrast and comparison of these as a management focus with the existing risk management practices of the WLC sector of the industry and the industry in general. These management practices, in construction, have to date had a quantitative, mathematical, focus and the move to analysing the personal perceptions of risk could be seen as a shift to a more qualitative basis.

The literature review, setting the theoretical context of the report, is followed by the methodology which outlines the method of analysis which has been devised to test that theory. This report analyses the sensitivity of the asset management forecast to those variables that are sensitive to the personal risk perception and bias of the WLC consultant. This has been done by calculating the asset replacement forecast of ten selected different building types, within the same project. This is a live project, the resultant forecasts for the selected buildings, as well as those not included in the analysis, being subject to quality assurance checks, and provided to the client. This project was carried out for a private sector client prior to bidding, in order to set a comparable for asset replacement cost forecasts by the bidders, which were a requirement of the bid.

The buildings, being from the same project, have the same external influences such as pressure from client, and reliability of capital data. A sensitivity analysis of the asset replacement forecast has then been undertaken by

altering, singularly, the variables that are subject to personal perception of risk by set percentages. The outcome of each of the forecasts with the altered variables have then been calculated as a percentage of the total real cost, as well as the total net present value (NPV) of the of original forecast. The LCC forecasts for projects typically either being assessed by one, or both of these methods. The calculation for the NPV also provides an indication of whether these costs are in the earlier or latter years of the profile. This analysis of results will look at the result data in comparison to the reports hypothesis and discussion in the literature review.

The analysis will be discussed in the results section of the report, with a wider range of data available in the Appendix. It should be noted that due to the live nature of the project used there is a level of confidentiality required and as such the data and project information made available in the report is limited.

Following the analysis of the results, details of the scope of the report, as well the key findings will be surmised in the conclusion. The conclusion will also make recommendations for future research based on the reports findings.

LITERATURE REVIEW

The hypothesis is that some decisions made by the LCC consultant when creating a LCC forecast are subject to personal bias. It is the aim of this study to establish that the LCC forecast is subject to the personal decision-making and bias of the LCC consultant and to determine which of the variables used are most affected.

This literature review provides a context in which the LCC forecast is generated. It includes an overview of the clients demanding LCC forecasts; calculation methods; and need for the judgement of the LCC consultant due to problems involved in the creation of the LCC forecast due to uncertainty and vagueness of the data.

The literature surrounding Decision Theory is then discussed. An overview of the evolution of Decision Theory is given, followed by detailed discussion on Preference Theory and Behavioural Theory. The practical applications of Decision Theories are then identified.

A brief overview of WLC, LCC and their demand

There is considerable debate in the industry on what LCC and WLC is, and what the differences are, if any. Boussabaine and Kirkham (2004) discuss this, stating eight definitions which include views that WLC is an evolution of LCC, that they are the same thing, and that LCC considers the commercial life of a project. The definition used in this report is included in those discussed and is as follows.

"In practice, we refer to WLC as the total operating costs of the building, including energy/utilities costs and facilities management elements that relate to the building, such as maintenance and cleaning. LCC refers to replacement building components within the building such as windows, fan coil units, etc. Over and above this are facilities management costs, such as maintenance and cleaning"

The demand for LCC forecasts in the industry is both due to owners and clients wanting to know more about the balance between initial capital cost and performance. There are new procurement routes such as the PFI, where a consortium holds the design, construction and operating and maintenance risk over the whole life of the project. In these projects LCC forecasts, as part of WLC, is a requirement of the treasury in order to establish best value for money and secure funding. In addition to these projects there have been a growing number of clients demanding certain performance requirements as part of design and build projects, for which the LCC calculation of the forecast is a key factor (Flanagan and Jewell, 2004).

Methods of Calculation for the Creation of the LCC Forecast

The LCC sector is in its infancy and as such there are not yet standard practices and methodologies applied throughout the sector. However each of these methodologies will consider similar data and these have been separated under various titles by different authors.

Kelly et al identify the 'Simple Payback' method, various 'Discounting' methods and 'Ranking and Weighting' techniques. Boussabaine and Kirkam (2004) summaries methods in to 'Deterministic Calculations', 'Stochastic Calculation' and 'Fuzzy Calculation' and Ashworth (1999) provides examples of both deterministic and stochastic calculations but does not name them as

such. Assessment of the methods shows that the 'Simple Payback' and 'Discounting' methods could be calculated using either 'Deterministic' or 'Stochastic' techniques. The 'Ranking and Weighting' techniques would typically use stochastic techniques.

Fuzzy logic is distinct from both 'Stochastic' and 'Deterministic' techniques. It is in its theoretical stages of development at present (Kelly et al, 2002). Kelly argues that the development of 'Fuzzy Logic' techniques shows that both practitioners and researchers have accepted that LCC forecasts are calculated using data that is vague and has missing elements.

The literature studied indicates that similar techniques are being used throughout industry to calculate LCC forecasts, though these techniques are often classified in different ways. The common finding, and problem identified in all of the literature studied is the lack of data and subjective nature of these techniques.

The creation of new methods for calculation of the LCC forecast by researchers is not readily adopted as best practice by the industry. Kelly et al (2002) and Ashworth (1999) argue that this is likely to be attributed to industry professionals, including LCC consultants, not trusting new techniques. This resistance creates a problem for the sector which uses a wide range of techniques with limited standardisation and which recognises that its current techniques require development.

Data Sources: Uncertainty and Vagueness

This report uses Capital Cost, Component Life, Sub-Component Life, Uplift Cost and Quantity of Replacement as key variables in the calculation of the LCC forecast. These variables have been selected from variables listed by the authors (Ashworth, 1999, Flanagan and Jewell, 2004, Boussabaine and

Kirkam, 2004) as those to be included in 'Deterministic', 'Stochastic', 'Discounted' and 'Simple Payment methods of analysis. Ashworth argues that the key variables in the calculation of the LCC forecast are repair and life expectancy cost and that these variables carry the most risk, in terms of the models accuracy. He argues that other, better developed, areas of cost forecasting, such as capital cost, use more accurate data and techniques. The infancy of the sector is seen to be partially responsible for LCC forecasts being subject to considerable errors in their assessment, due to their reliance on the decision-making of the LCC. He concludes that this decision-making or "feeling for the correct solution" is derived from the necessity of the LCC consultant to produce a forecast with limited data.

The analysis of literature shows that, of the key variables in the creation of the LCC forecast, the focus has been on Component Life and Sub-Component Life. This focus has resulted in data sources for these variables (Ashworth, 1999, Flanagan and Jewell, 2004, Boussabaine and Kirkham, 2004) from the following sources;

- Component and building material manufacturers
- Building Maintenance Information (BMI)
- The former National Building Agency
- Housing and Property Manual
- The former Property Services Agency
- Royal Institute of Chartered Surveyors
- Building Research Establishment
- Chartered Institute of Building Services Engineers

- Construction Price Books
- Maintenance Price Books

Assessment of common methodologies and the variables used against the data available means that personal decision-making is required in order to create a LCC forecast. Whilst this is commonly discussed as a problem (Ashworth, 1999, Boussabaine and Kirkham, 2004) it is also argued that the decision making in LCC can be seen not just to be dependent on a lack of data. The accuracy of the LCC forecast is also dependent on the requirements of the user and the users focus on maintenance and care in use. Ashworth also outlines that poor design and detailing of buildings and components as well as the quality of constructional practices on site impact on the accuracy of the LCC forecast. The LCC consultant's interpretation of these considerations can result in a wide variance in decisions made.

This problem of the bias in the decision-making of LCC consultants in calculating a LCC forecast is illustrated by a report by Building Maintenance Information (2001), which looks at the Component and Sub-Component lives assumed by industry professionals. The results received varied wildly for each component for example the report showed that a plastic water storage tank had lives attributed to it, by consultants, ranging from six years to over one hundred years. The variance of the results supports Ashworth's observation that professionals make decisions on what values to use for the variables in the creation of the LCC forecast based on "*a feeling for the correct situation*". It could be speculated that whilst increased availability of data would reduce this range, consideration of care in use, and a focus on maintenance, design and construction quality would mean that there would be difficulties in the creation of a set data source for all building, client and user types. Therefore improved data would reduce risk by providing a base indication of the values to be used, although these would need adjustment on

a project-by-project basis. This would result in there still being personal bias in the decisions made concerning those adjustments.

This shows that the LCC forecast is subject to decisions made by the LCC consultant. This can be seen to be advantageous in providing a client specific forecast, but also the disadvantage of the wide disparity in forecasts resulting from the subjective decisions of LCC consultants. This disparity of results causes a problem both for the client and consultant in knowing where the risk exists in the LCC forecast.

A better understanding of the theory behind which, and how, these judgements and decisions are made and an understanding how they impact the model, will aid both the client and the LCC consultant in knowing where this risk exists. The next section of the review will discuss the theory and related research on decisions making and personal bias.

The development of decision making theory and its associated risk

Overview

The literature on risk perceptions and judgemental bias has evolved and with it the perception of their effect upon the construction sector. Loosemore et al (2005) outline the three main stages in evolution as the economic perspective, the psychological perspective and the sociological perspective. The economic perspective assumes that people respond rationally to risks based on costs and benefits and apply the result they feel will benefit them, personally, the most. This is also known as Preference Theory (Kamper, 2000). Following this there was the idea of the psychological perspective, which suggested that individuals based their judgement on past experiences, cultures and education which mean that the perceived risk is either amplified or attenuated. This is also known as the Behavioural Theory (Kamper, 2000). Loosemore et al (2005) then state that there is the sociological perspective where the decision is made by the decision-maker based on their perception of how the risk will impact the community in which they exist. This perception of risk is largely relevant on large construction projects whereby the project managers have to try and manage public perception on construction projects and is not discussed in detail in this review. Kamper argues that the Sociological Perspective of risk cannot be differentiated from those required for Perception Theory as the focus is now on the expectations that the decision react to, as opposed to the preferences in making a decision.

Perception Theory – The Economic Perspective

Preference theory can be defined as *"an action performed by an individual or corporate actors who, on the basis of given preferences choose a course of action out of a given range of alternatives" (Kamper, 2000)*

The development of theory regarding decision-making theory is closely related to the research regarding the risk of those decisions made. This has already been discussed above where Loosemore et al's Economic Perspective of risk is seen in line with Perception Theory. Frank Knight (Kamper, 2000) developed Perception theory, one of the base theories of risk and decision-making. The theory was developed in the context set by neo-classical economics. The general theory was that decisions were made on the basis of preference, which in turn was based on the decision maker's degree of rationality. A decision maker methodically calculates the probability of each of the possible outcomes of a decision and makes a rational decision based on the outcome. Risk, in this theory is defined as measurable uncertainty and resides in the allocation of a probability of occurrence to each of the possible outcomes arising from a decision.

Using this framework scientific analysis can be applied to risk but not uncertainty, creating the problem of how to turn uncertainly into risk. The development of this theory was supported by the development of other complimentary theories such as the Expected Utility Theory (Biswas, 1997).

Literature debates the advantages and disadvantages of Preference Theory. The further development of decision-making theory has been largely due to the issue of classifying risk and the realisation that decisions are required to be made in situations where all of the possible courses of action cannot be predicted with certainty (Schlaifer, 1969). This, alongside the realisation that decisions were made intuitively (Hogarth, 1980) and that *"Virtually all*

important business decisions are made under uncertainty" (Schlaifer, 1969) were key in the development of Behavioural Theory.

Behavioural Theory – The Psychological Perspective

Kamper (2000), in discussions regarding Behavioural Theory states that *"decision making is an activity generated by behavioural expectations".*

The realisation that Perception Theory was not readily applicable in practice and the subsequent development of Behavioural Theory was accompanied by the development of the Allais Paradox and Ellsberg Paradox, which both disproved the Expected Utility Theory (Biswas, 1997).

The Behavioural Theory of decision making emerged mainly due to the development of thinking surrounding bounded rationality and ambiguity. Its key basis is that decisions are made based on the chances that various possible events either will or won't occur and the resultant consequences and their desirability to the decision maker.

The concept of bounded rationality applies to the decision maker, who even though perceived as irrational by measure of Perception Theory, has made the most rational decision under the given circumstances. It is argued by many authors that the absolute rationality required by Perception theory prevented its application in practice due to the cognitive limitations of the decision maker. Under Behavioural Theory the rationality of the decision maker is seen in a specific context and is therefore seen as bounded rationality. This new theory also provided a different perception of risk where risk is seen the perception of potential future damage arising from the decision. It is subjective. Collenteur and Jepma (1993) stress the importance of personal bias on the decision-makers perception of risk, and therefore the ultimate decision made.

The importance of the rationality of man

Lee (1971) perceives that the central idea to both Preference and Behavioural Theory is the 'rational man'. He warns over the ambiguities of defining rationality. Whilst the majority of literature assumes, or states agreement with mans implicit rationality Lee observes the work of Sigmund Freud on the irrationality of man. If man is assumed as rational, as argued by Lee (1971) and Biswas (1997), ambiguity can be seen to exist in most decisions. Especially where the organisational technologies are unclear, the preferences and goals are ill defined and there is no stable participation of decision makers in the process.

The move away from using preferences as a basis for rational decision-making makes it harder for the observer to judge whether the decision maker has acted in a rational manner. In a practical example this can be seen as difficulties for the client to evaluate whether the right decision has been made.

Kamper suggests two possible ways of evaluating this. The first is the logic of consequence where decision alternatives are chosen by evaluating there perceived consequences according to the preferences of the decision maker and is based on the anticipation, calculation and analysis of the future. This viewpoint is supported by the Theory of Framing and the Common Ratio Effect (Biswas, 1997). These show that decision making under uncertainty is the result of the subjective perception of the status quo. This is also supported by Edward Tolman's Expectancy Theory (Lee, 1971) where learning is seen as key to understanding the probability, or expectancy, of reaching a certain goal.

The second is the logic of appropriateness where decisions are made by matching the situation to a previously established, and therefore historic, rule.

Practical Application of Decision Making Theory

"In real life people have to make decisions when they have little basis on which to evaluate a possible consequence" Lee (1971)

The rationality on which both Preference Theory and Behavioural Theory exist was questioned earlier. Lee (1971) argues that if man is a rational being, he must be already making rational decisions under the given circumstances, and if this is the case how can any improvement be realised from the application of techniques or findings from decision theory. It can be seen that the increase in accuracy of the data around which the decision is based would increase the overall accuracy of the decision. Shlaifer (1969) and Simon (2000) disagree with this and argue that the accuracy of a decision can be improved through a better understanding of thought processes. They propose the use of "Decision Diagrams" and "Decision Trees" to aid the decision maker to decompose the problem and think through the implications of one set of factors at a time.

Simon supports Shlaifer idea that greater understanding of the thought process reduces the risk but proposes decisions be evaluated using a cost-benefit analysis. This requires the cost and benefit of each decision be analysed before a decision is made.

Lee promotes a mix of both objective analysis of the data, and a subjective approach with the balance depending on the time the analysis will take, as well as its cost. This is supported by Collenteur and Jepma (1993) who propose the following system for decision-making based on this concept.

1. Problem recognition;
2. Search for alternative solutions;
3. Evaluation of the alternatives;
4. Choice of (best) action;

5. Implementation of the choice made; and
6. Assessment of the results.

Whilst different authors have proposed various models to understand and mitigate the risk associated with decision-making ambiguities exist in organisations, which affect the decision maker's ability to make a rational decision. This ambiguity is created where the organisational technologies are unclear; the preferences and goals are ill defined; there is no stable participation of decision and possibly multiple goals for the decision (Collenteur and Jempa, 1993). This view is summarised by Lee (1971) who states *"A decision maker who carefully calculates probabilities but who is confused about what consequences would really satisfy him may be on a fool's errand.*

The use of 'Experts' is suggested by Simon (2000), not as a strategy for decision making like those previously mentioned, but in order to aid the process. The use of an expert, he argues, helps to guide the decision maker through the pitfalls and traps of making the decision, helping to prevent decisions being based in isolated arguments. This could also help to mitigate the personal decision bias, which he refers to as 'desire to believe' and 'biasing hopes'. The alternative to using an expert to guide the decision making, also proposed by Simon is that the decision maker be trained to have a good breadth of information to inform the judgement. This latter suggestion is not supported by Loosemore et al (2005) who observes that *"Peoples subjective perceptions of risk often differ from the objective assessments made by experts and scientists".* However all authors do not support the use of experts. Hogarth notes that most professionally trained persons have both followed courses and received on-the-job training. However he argues that almost none of these have given serious thought, or received instruction concerning conceptual skills and the intuitive processes they use to manipulate their substantive knowledge. He suggests that, as opposed to the use of experts, professionals are better trained

to recognise the risks and use their knowledge in the most rational manner in that context.

Summary of Key Discussions

Through the analysis of the LCC sector, and the methodologies and calculations which are used to generate the LCC forecast, it has been established that there are variables in the creation of the LCC forecast that are subject to personal decision making.

The literature surrounding decision-making has been discussed and it can be seen that the Perception Theory of decision-making has been replaced by the Behavioural Theory of decision-making. The development of this newer theory was driven by the inability of Perception Theory to be applied in practice. Perception Theory can only be used in situations where all possible choices and outcomes can be fully evaluated by the decision maker. Behaviour Theory can be used to better understand the decision making process as it recognises that rational decisions are required to be made without fully knowing either all of the possible actions, or the outcomes of these actions.

Whilst the move from Perception Theory has provided a more practical basis upon which to analyse decision-making, the result of its application is not quantitative and cannot be observed as a rational decision by an observer. This results in risks not being clearly understood by the decision maker, or communicated to those who may be impacted by this risk. Clearly this is a problem in the creation of the LCC forecast where it has been recognised that decisions are made without full knowledge of the choices or outcomes. There have also been problems identified in the decision maker not understanding the impact of personal bias, and not using a structured method in order to

fully analyse each decision. There have been models provided by various authors in order to help decision makers to understand and mitigate the risks involved in those decisions. Analysis of the sector however has shown no evidence of these techniques being applied (Kelly et al, 2002, Ashworth, 1999). A greater understanding of which variables in the LCC forecast are subject to decision making by the LCC consultant, as well as there likely impact would provide a framework to which those techniques could be applied. The application of these techniques could reduce risk by allowing each decision to be methodically analysed, as well as formalising the analysis, which can then be more clearly communicated to the client.

HYPOTHESIS

The LCC forecasting process has been based, to date, on quantitative methods of analysis, such as varying either singular variables to the models to carry out options appraisals, or looking at the reliability of component data. However in the construction industry, with the limited amount and quality of data available, it can be seen that the forecasts are highly subjective to assumptions made by the LCC consultant.

It can be speculated that the LCC forecasting process is biased, with assumptions being made at various stages by the LCC consultants and analysts carrying out that forecast.

My hypothesis is that the LCC forecasting process carries substantial risk in the cost accuracy due to personal perceptions of risk and decision-making by the LCC consultants, and that this will be most prominent in the assumptions made regarding Component Life and Sub-Component Life.

METHODOLOGY

The hypothesis set out was that the LCC forecasting process carries substantial risk in the form of personal perceptions of risk and personal decision-making by the LCC consultants, and that this will be most prominent in the assumptions made regarding Component and Sub Component Life. In order to either prove, or disprove this hypothesis it is first necessary to establish that the inputs to the LCC forecast are subject to the personal risk perceptions and bias of the consultant. This has been discussed in the literature review and it can be seen that there are variables in the creation of the LCC forecast that are subject to these factors. Set out below is the method by which the data was gathered, and the hypothesis tested.

Creation of the LCC Forecast

The formation of the LCC forecast for asset replacement is typically carried out by in Microsoft Excel or specifically developed software. This LCC model can then be used to either enter data for a building, a building type, or a whole project of different buildings, depending on the requirements of the client. The project used in this case was a mixed-use development. The brief from the client of the project used was for the provision of commercial advice, asset replacement forecast and facilities management of the development. A separate asset replacement forecast was required for each building type. The LCC period was set at thirty years.

A design team was appointed to develop designs and the calculation and provision of capital cost data was by appointed quantity surveyors. The development of the design and costs of the building were, alongside the WLC services, required to provide the client with a forecast of cost and a comparator with which to compare the bids when they were submitted. The WLC consultants were able to work with the quantity surveys and design team to clarify queries, as well as providing commercial advice to the client.

Defining LCC asset replacement from maintenance

The client's requirements were for the provision of the asset replacement forecast and facilities management costs for the project. It was necessary to clarify the boundary between these two factors at the start of the project. The uncertainty in defining this boundary is that whilst the asset replacement costs are covered under the definition of LCC, there are also the maintenance costs of that asset. The ISO 15686-5 definition of maintenance includes *"conducting corrective, responsive and preventative maintenance on constructed assets, or their parts, and includes and associated cleaning, servicing, repainting, repairing and replacing parts where needed to allow the constructed asset to be used for its intended purposes"*. Through this definition, and the ISO definition of LCC it can be seen that the two overlap. It can be seen that maintenance and asset replacement are linked. The better you maintain an asset, the less frequently you are likely to need to replace it. The definition of what an asset is also undefined; the replacement of the fan of a ventilation system could be seen as a piece of asset replacement, but also of the maintenance of part of the ventilation system. In this case a matrix was agreed by working with the client. A full listing of the components considered as part of the LCC forecast for this study is included in the appendix.

Data Selection

There were in excess of twenty building types on the project. This analysis uses ten of widest range of building types. Each of the ten building types selected contain varying specifications. As a result the assumptions behind the variables for the replacement of the assets and there decision making risk vary. The repetitive use of similar models in the analysis, with similar specifications, would result in a very narrow range of results that were heavily biased to a particular specification.

The ten building types selected for this project were

1. Workshop Facility with Storage
2. Indoor Swimming Pool
3. Shopping Centre
4. Restaurants
5. Private School
6. Petting Zoo
7. Convention Centre
8. A one bed apartment within a multi apartment complex
9. A High Quality House
10. Golf Clubhouse and Maintenance Building

Analysis of Variables Subject to Personal Risk Perception of the WLC consultant

The variables used in calculating the asset replacement forecast are similar industry wide, but will vary in small ways between companies, and in some cases, consultants. It is these variables that, if subject to personal risk and bias of the WLC consultant, will be assessed in the sensitivity analysis. The variables that were required for the calculation of the asset replacement

forecast in this project have been stated below. This includes an overview of each and details of their inclusion or exclusion from the sensitivity analysis.

- Capital Cost; as previously discussed this data was received on this project from the Quantity Surveyors. This data can be received from a third party, as in this case, or calculated by the consultant if they have the necessary experience. On this project the data was provided by a third party for direct input into the model in the form of rates for each of the various components, as such there was no assumption made by the consultant. Clarification could be sought from the quantity surveyors and design team. The inaccuracy of capital cost data has been the subject of several studies of WLC, however the LCC consultant for the buildings considered was not required to make decisions regarding the capital cost. As such this variable is not used in the sensitivity analysis.

- Uplift Cost; the construction cost rate is not equal to the replacement rate. Due to the differing nature of construction from replacement the cost rates for the latter tend to be greater than the former. An uplift rate can be applied to the capital cost to equate it with the predicted replacement cost. This cost is therefore dependent on assumptions made by the WLC consultants and as such is included in the analysis.

- Component Life; there is a limited amount of data available for the replacement intervals of items. This information is published by Building Life Plans, Building Performance Group, the chartered Institute of Building Services Engineers (CIBSE) as in studies such as those carried out by Building Maintenance Information (2001) and Building Magazine. However these reports themselves are limited to a base list of components and have there own assumptions behind

them. This may result in the recommended life not being suitable for the project. As such whilst the WLC consultant has an anchor around which to base assumptions, there are still assumptions made regarding this variable. The variable is therefore subject to the personal risk perception and bias of the WLC consultant and is included in the analysis

- Sub Component Life; This variable can be seen as Component Replacement, but specifically applied to part of an asset. For example the window would be the Component, but the ironmongery, sealed glazed unit and seals are Sub-Components. The Sub-Components will have a life separate to that of the Component. The Appendix to this study includes a full list of the components analysed in the buildings considered, and differentiates the Components from the Sub-Components.

- Quantity of Component Replacement and Repair; this allows for replacements or repairs to be made where less that 100% quantity is required. For example 80% of one type of carpet may need to be replaced at a shorter frequency in heavy use areas, than in other areas. There was no published data found on recommendations for the quantity of repair. The variable is therefore subject to assumptions by the WLC consultant and is included in the analysis

- Following the above assessment it can be surmised that the Uplift Cost, Component Life, Sub Component Life and Quantity of Replacement will be the variables used in the sensitivity analysis.

The Sensitivity Analysis

The sensitivity of the calculation of the asset replacement forecast are based on the actual model calculated for each of the ten building types. The model uses each of the variables outlined above to create a cost forecast of asset replacement over the concession period of thirty years. The forecasts for each component are added to give a total cost of asset replacement over the thirty years. This cost forecast is, in part, dependent on the above selected variables and as such is dependent on the personal risk perception and bias of the WLC consultant.

The sensitivity of the model to the selected variables has been tested by amending each of the variables, individually by +10%, +20%, +30%, +40%, -10%, -20%, -30% and -40% and then running to model to generate a cost forecast for each eventuality. There are four variables and eight adjustments of each variable which results in the calculation of thirty-two LCC forecasts.

The thirty-two costs are added to calculate their total 'real' cost and Net Present Value (NPV). The NPV is the total cost of the LCC forecast with the application of a discount rate. The discount rate reflects the cost of borrowing, and the cost of inflation (Ashworth, 1999). The total 'real' cost is the total cost of the LCC forecast over the concession with no discount rate applied. The discount rate used in this study is 3.5%, as recommended for projects with a concession up to thirty years in the Treasury's Green Book.

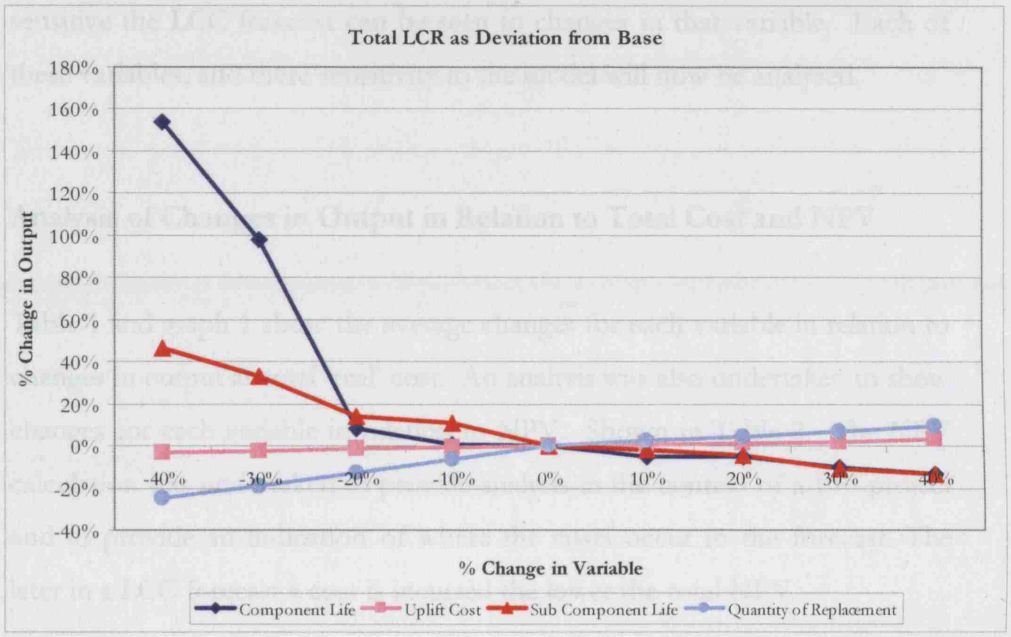
The total 'real' cost and NPV for each of the LCC forecasts with amended variables are then compared as a ratio with the base total, or NPV, respectively. This provides the percentage change in output for each variable. The plotting of the percentage change in variable of total cost and the percentage change of NPV, against percentage change in variable allows the sensitivity of the model to be assessed for each variable. The greater the

percentage change in variable total or NPV cost, the more sensitive the model is to changes in that variable.

The variables are then ranked in order of the models sensitivity to them. The variables to which the model is more sensitive indicate areas where the personal risk perception and bias of the WLC consultant has the most impact. It is these areas where the most risk, in terms of risk perception and bias of the WLC, are, and as such where the greatest awareness of this risk should be demonstrated by the WLC consultant. This awareness of risk should also be discussed with the client to allow them to manage the risk inherent in the model as a result of the LCC consultant's decision-making.

RESULTS

The results of the analysis as described in the methodology are included here. Analysis of these results is also undertaken, followed by a conclusion.



Graph 1: Average Sensitivity of LCC Forecast Output to Changes in Variables, measured in 'real' cost

Total 'real' LCC forecast for each change in variable, as a percentage of original output	-40%	-30%	-20%	-10%	0%	10%	20%	30%	40%
Component Life	154.15%	98.19%	8.07%	0.81%	0.00%	-4.78%	-4.80%	-10.17%	-13.57%
Uplift Cost	-2.92%	-2.19%	-1.46%	-0.73%	0.00%	0.73%	1.46%	2.19%	2.92%
Sub Component Life	46.24%	33.11%	13.77%	10.77%	0.00%	-1.71%	-4.08%	-10.86%	-13.19%
Quantity of Replacement	-25.03%	-18.77%	-12.51%	-6.25%	0.00%	2.37%	4.73%	7.09%	9.44%

Table 1: Sensitivity of LCC Forecast Output to Changes in Variables, measured as a percentage of 'real' cost

The above graph shows, on the y-axis, the average change in percentage of the output of the LCC forecast in terms of total cost over the thirty-year concession. The x-axis shows the percentage change in variable. Each of the variables, the Component Life, Uplift Cost, Repair Interval and Quantity of Replacement are plotted. The degree of sensitivity of the LCC forecast is indicated by the percentage change in output for each of the percentage changes in variable. The larger the percentage change in output is, the more sensitive the LCC forecast can be seen to changes in that variable. Each of these variables, and there sensitivity to the model will now be analysed.

Analysis of Changes in Output in Relation to Total Cost and NPV

Table 1 and graph 1 show the average changes for each variable in relation to changes in output as total 'real' cost. An analysis was also undertaken to show changes for each variable in relation to NPV. Shown in Table 2. The NPV calculation was undertaken to provide analysis in the context of a PFI project and to provide an indication of where the costs occur in the forecast. The later in a LCC forecast a cost is incurred the lower the total NPV.

Analysis of the results of both NPV and real costs are very similar, it can be seen that:

The Replacement Interval when measured, as NPV is lower than that of the 'real' total cost for all deviations. This would indicate that the majority of the repairs carried out are in the latter years of the LCC forecast. If a change in variable results in a lower percentage change of the NPV total cost, than would be the case for the real cost, it indicates that the greater cost would be incurred during the latter years of the LCC forecast.

In the majority of cases changes to the component replacement lives have resulted in a greater deviation from the base for NPV than 'real' total cost. This would indicate that the majority of component replacements occur in the earlier years of the LCC forecast.

The percentage of cost associated with Quantity of Replacement when measured, as NPV is lower than that of the 'real' total cost for all deviations, as with the Repair Interval. This similar trend indicates that the majority of costs related with the changes in quantity, are associated with the quantity of replacement rather than the quantity of components replaced.

There are only minor differences of for the changes in 'real' cost when compared with NPV. The results discussed in the remainder of this report will be carried out in relation to the 'real' total cost but can be seen also applicable to NPV.

Total NPV of LCC forecast for each change in variable, as a percentage of NPV of original output	**-40%**	**-30%**	**-20%**	**-10%**	**0%**	**10%**	**20%**	**30%**	**40%**
Component Life NPV	155.08%	98.96%	8.05%	0.76%	0.00%	-4.83%	-4.85%	-10.29%	-13.71%
Uplift Cost NPV	-2.92%	-2.19%	-1.46%	-0.73%	0.00%	0.73%	1.46%	2.19%	2.92%
Sub Component Life NPV	43.06%	31.00%	12.94%	10.18%	0.00%	-1.67%	-3.82%	-10.59%	-12.85%
Quantity of Replacement NPV	-24.99%	-18.74%	-12.49%	-6.24%	0.00%	2.34%	4.66%	6.98%	9.30%

Table 2: Sensitivity of LCC Forecast Output to Changes in Variables, measured as a percentage of Net Present Value

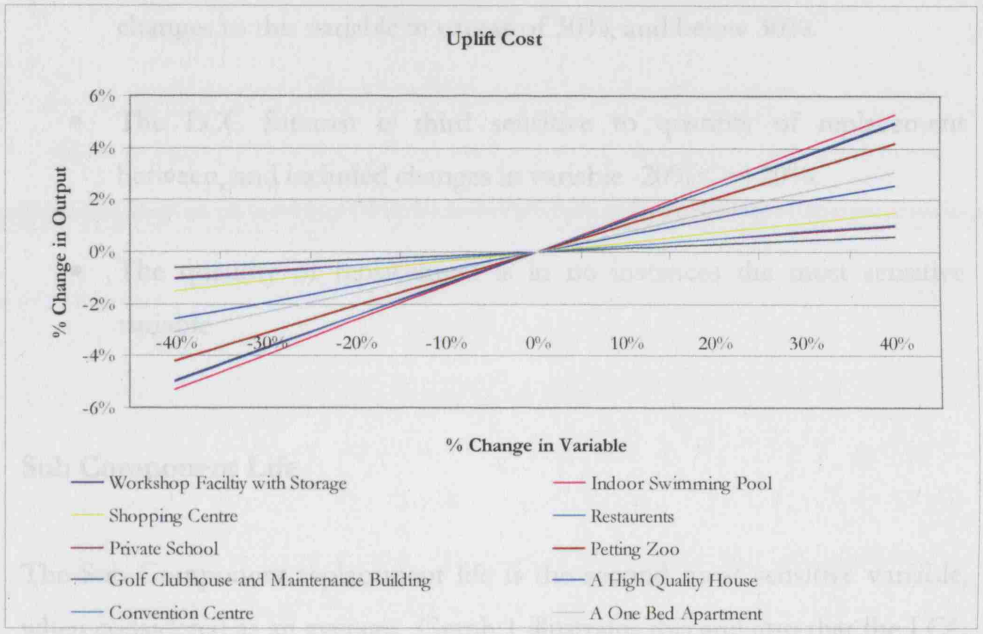
Uplift Cost

Graph 1 demonstrates the average adjustment in uplift cost which shows a negative trend to the output when the variable is reduced and a positive trend when the variable is increased. Therefore;

- The LCC forecast increases and decreases in line with the uplift cost applied, if all other variables remain constant.

- The change in output is moves in proportion equally with each change in the variable, regardless of whether this is a negative or positive change.

- This can be further verified by analysing the sensitivity of the Uplift Cost for each building type. This is shown in Graph 2 below.



Graph 2: Sensitivity of LCC Forecast Output to Changes in Uplift Cost Variable, measured in 'real' cost

- Analysis of the uplift cost on Graph 1 and the supporting Table also shows that the LCC model is least sensitive, on average, to changes in the uplift cost and that this remains between ± 6% for all changes in variable.

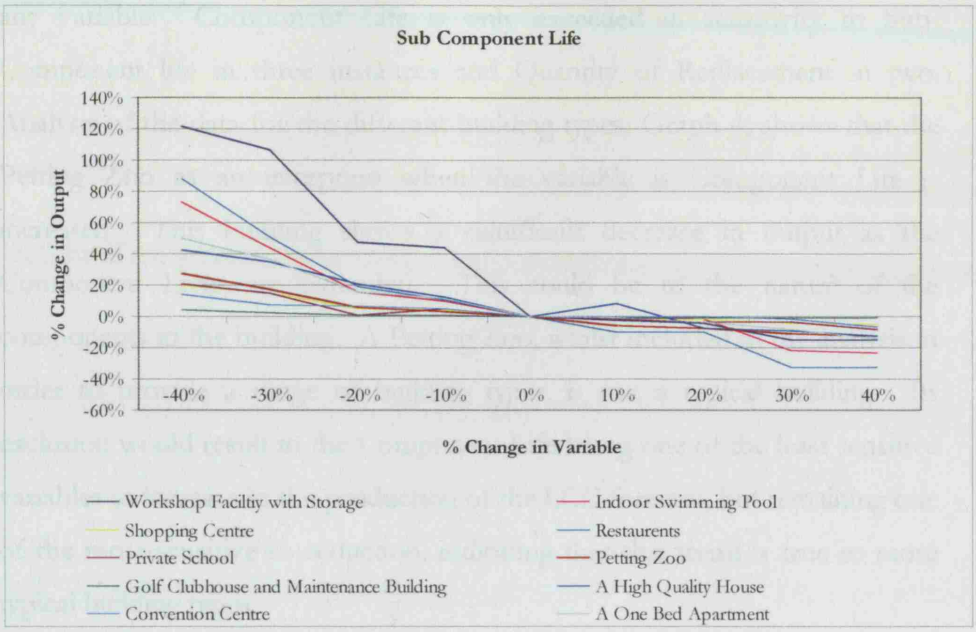
Quantity of Replacement

The Quantity of Replacement applies to both the Component and Sub-Component replacement. Analysis of Table and Graph 1 shows that

- The output is directly proportional to the change in quantity of replacement, as indicated by the straight line.
- The LCC forecast is second only to uplift cost in its sensitivity to changes to this variable in excess of 30%, and below 30%.
- The LCC forecast is third sensitive to quantity of replacement between, and included changes in variable -20%<>+20%.
- The quantity of replacement is in no instances the most sensitive variable

Sub Component Life

The Sub Component replacement life is the second most sensitive variable, when considered as an average. Graph 1 illustrates this and also that the LCC forecast is more sensitive to negative changes, than positive changes, to this variable. This is more obvious if the building data is analysed, as below in Graph 3.



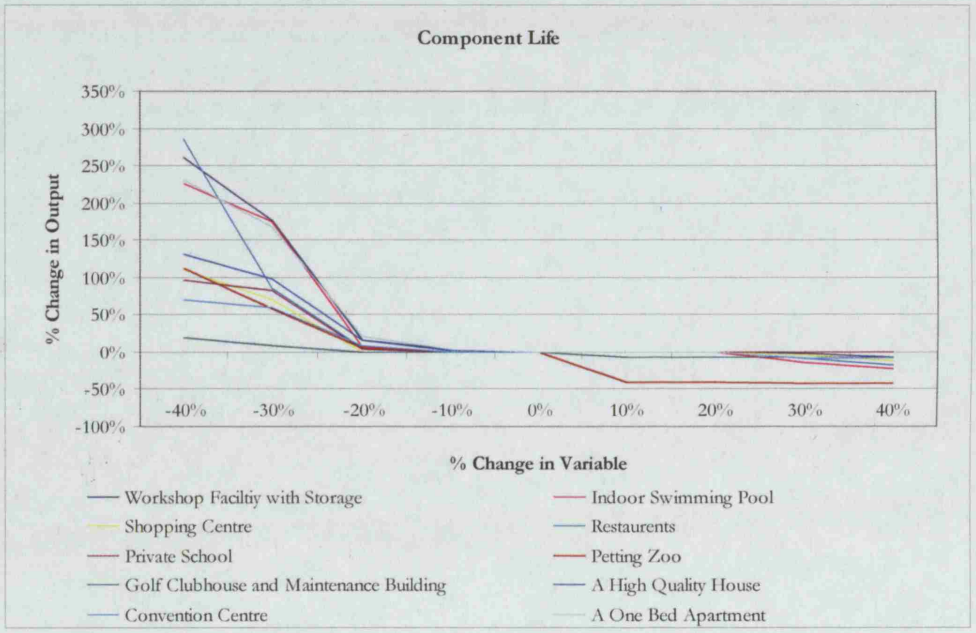
Graph 3: Sensitivity of LCC Forecast Output to Changes in Sub Component Life Variable, measured in 'real' cost

Graph 3 shows the impact of changes in the repair interval to the change in output for all of the building types considered. This clearly shows that the LCC forecast is more sensitive to reductions in the Sub Component replacement intervals. The building showing the most sensitivity is the Workshop Store and Guard Room. The least sensitive is the Golf Clubhouse. The supporting data to these graphs was assessed for possible differences in these such as varying amounts of fabric and mechanical and electrical but no conclusions were drawn.

Component Life

The changes to the component, by analysis of graph 1, clearly shows the most sensitivity at the lower extremes of the change in variable. This is shown by the LCC forecast output increasing in excess of 150% for a change in variable of –40%, which is more than triple any deviation from the base forecast for

any variable. Component Life is only exceeded in sensitivity to Sub-Component life in three instances and Quantity of Replacement in two. Analysis of the data for the different building types, Graph 4, shows that the Petting Zoo as an exception when the variable is Component Life is increased. This building shows a significant decrease in output as the Component Lives are extended. This could be to the nature of the components in the building. A Petting Zoo, whilst included in the analysis in order to provide a range of building types, is not a typical building. Its exclusion would result in the Component Life being one of the least sensitive variables to increase in the production of the LCC forecast, but remaining one of the most sensitive to reduction, indicating that this trend is true to more typical building types.



Graph 4: Sensitivity of LCC Forecast Output to Changes in Component Life Variable, measured in 'real' cost

Discussion of Results

The aim of this report was first to establish that the LCC forecast was subject to personal decision making by the consultant and then to rank those variables, which are subsequently impacted, in order of their relative sensitivity to the LCC forecast.

One of the key findings of this report has been that the model is not significantly sensitive to differences when the output, and changes in sensitivity, were measured using the NPV, as opposed to 'real' cost.

The LCC forecasts for the buildings that have been analysed have been carried out for a private client. It could be speculated that this would bias and limit the LCC consultant to which values to use, for the variables considered. Whilst the change to output effected by the changes to the LCC variables in terms of NPV has only shown marginal differences to those calculated in 'real' cost this does not fully set the context of a PFI project. There may be variables other than the ones identified in this report which impact on the LCC forecasts carried out in PFI projects.

The results have shown that the variables cannot be ranked overall in order of sensitivity, as the sensitivity varies both depending on level and extent to which the variable is increased or decreased.

The output of the LCC forecast is least sensitive to Uplift Cost, with changes of +-40% of the variable only resulting in -+6% change in output. The personal decision making of the LCC consultant can be seen to carry less risk in this variable, and as such this variable holds less risk in the LCC forecast overall.

The Uplift Cost, as well as the Quantity Replacement of the Components and Sub-Components has both been shown to be directly proportional to the

output of the LCC forecast. These variables are the only two which generate a negative effect on the output when they are increased. The LCC forecast, if only the range in percentage change in output is considered, can be seen to be the second least sensitive to changes in the Quantity Replaced. The degree of change in output is –40 %<> 20%. It could be speculated that the linear, and as such predictable, nature of this variable means that the LCC consultant is better able to predict the degree of risk associated with decisions regarding this variable. This Quantity Replaced, as well as the uplift cost may be better suited to quantitative methods of risk calculation due to the greater predictability of the outcomes of the decision.

The Component and Sub Component variables, when considered both as a range and an average are most sensitive in the calculation of the LCC forecast. The LCC forecast is more sensitive to reductions in these variables. The greatest range in output can be seen in the Component replacement at -50 %<> 300%. The second greatest range is the Sub-Component life at -40 %<> 130%. It should be noted that the model shows very similar sensitivity to positive changes in both of these variables, with the greatest sensitivity of the Component Life being shown with changes less than –20%. The full list of Components and Sub-Components for each of the building type is listed in the appendix. It could be speculated that the significant increase in sensitivity of the components when reduced by –40 %<> 20% is due to items that are cost significant in terms of the LCC forecast being brought into the concession period. This would indicate that particular sensitivity to those Components and Sub-Components with lives that fall just after the concession are a particular area of risk in the LCC forecast and should be closely monitored by the LCC consultant.

It is interesting to observe that, as discussed in the literature review, the greatest volume of data available to LCC consultants, even if limited, is Component and Sub-Component life. The focus of the industry on this

indicates awareness that this is where a significant part of the risk in LCC forecasts exists. However it could also be speculated that this is due to the nature of the construction industry in managing risk. The literature review outlined that there has been a focus on quantitative techniques to manage risk. Component and Sub-Component data is easier to capture quantitatively, than Uplift Cost and Quantity Replacement. The Uplift Cost and Quantity Replacement data can only be measured post occupancy, where as manufacturers data can provide an anchor on which to look at Component and Sub Component lives. The LCC consultant is therefore reliant on a post occupancy relationship with the client in order to collect this data. This creates difficulties when the client is not the occupier of the building where recommendations for the Component and Sub Component lives made in the LCC forecast may not be observed.

The risk of the LCC forecast, in terms of the decisions made by the LCC consultant impacting the outcome of the LCC forecast, are primarily in the Component Life variable, followed by the Sub-Component Life, Quantity of Replacement and Uplift Cost variables, in decreasing order. The LCC consultant should be aware of the sensitivity of the model to these variables when making those decisions. In order that the client know where the risk is in the LCC forecast, and to enable the managing that risk, it is important that assumptions made are clearly communicated to the client.

CONCLUSION

The unique nature of the industry, and the unique ways in which buildings are occupied and maintained, mean that the professional judgement of the LCC consultant will not be negated by better data. The possible outcomes for all of the various decisions regarding the variables discussed will not be known to the LCC consultant and therefore decision making can not be made using Preference Theory. It can be seen that that one of the key flaws of Preference Theory is apparent and that if attempts were made to quantify the decisions made in the creation of the LCC forecast and the associated risk *"The result is quantifiable but, from a sociological perspective not realistic"* (Kamper, 2000).

Behavioural Theory shows greater similarity with the decisions made in creating the LCC forecast. That is that the decisions making is carried out under conditions where all of the possible courses of action cannot be predicted with certainty (Shlaifer, 1969). Therefore these decisions are subject to judgement, which in turn is subject to the behavioural expectations of the decision maker. If Kamper's two models for evaluating decision making are considered it can be seen that both decision making as a result of perceived consequences against the preferences of the consultant, and the logic of appropriateness are relevant to decision made by the LCC consultant. Decision-making as a result of perceived consequences is linked more closely with decisions regarding the Uplift Cost and Quantity of Replacement where there is little data available and the LCC consultant is basing the judgement on anticipation, calculation and analysis of the future. Decisions regarding the Component and Sub-Component where there is more data available is subject to both the perceived consequences by the LCC consultant but is also based on the logic of appropriateness where the decision is based on a previously

established rule. That rule is the published guide life of the Component or Sub-Component.

It has been established that Behavioural Theory is more relative to those decisions made by LCC consultants than Preference Theory. The tools used to evaluate the risks associated with Behavioural theory are under development, many of them being currently applied in a theoretical context. Two of these tools are Shlaifer (1969) and Simons (2000) 'Decision Diagrams' and 'Decision Trees' which could aid the LCC consultant in evaluating the risks in the LCC forecast, allowing the risk to be reduced through the greater clarity gained in its consideration. As such whilst the decisions, as they are made using Behavioural Theory, will be subject to a degree of personal bias (Hogarth, 1980), these tools will increase the clarity in which they are made.

This report has established that the LCC forecasts sensitivity to the variables studies, with the must sensitive first is Component Life, Sub-Component Life, Quantity of Replacement and Uplift Cost. The hypothesis of this report was that the LCC forecasting process carries substantial risk due to decision making by the LCC consultant and that this would be most prominent for Component Life and Sub-Component Life. Following analysis the hypothesis can be seen to be correct, though the variables sensitivity varies for positive and negative changes, with the forecast illustrating particular sensitivity to decreases in the Component and Sub-Component Life. It can be speculated that the use of decision-making tools and the awareness of the LCC consultant of personal bias, would increase the accuracy of the LCC forecast. It would also permit the clearer communication of the risks to the client. It is recommended that the use of decision-making tools should primarily be applied to decisions to Component and Sub-Component Life, where the highest sensitivity exists. This provides the greatest impact in the management of risk by LCC consultants, and the portraying of this to the client. It is recommended that the sensitivity analysis carried out be applied to

a wider range of building types and that decision making tools be applied to the creation of the LCC forecast to create a case study from which a better understanding of risk in decision making can be gained.

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APPENDIX

Workshop Facility with Storage

Clear cells indicate Component Replacement. Cells in grey indicate a Sub-Component Replacement.

BCIS Structure		Element Description
1 - Substructure	1 - Substructure	Concrete
1 - Substructure	1 - Substructure	Earth works
1 - Substructure	1 - Substructure	Form Work
1 - Substructure	1 - Substructure	Base (binding) 100mm thick
1 - Substructure	1 - Substructure	Reinforcement
1 - Substructure	1 - Substructure	Waterproofing
1 - Substructure	1 - Substructure	Concrete; 100mm thick slab
1 - Substructure	1 - Substructure	Concrete; 200mm thick slab
1 - Substructure	1 - Substructure	Fabric Reinforcement
1 - Substructure	1 - Substructure	Waterproofing/ DPM
2 - Superstructure	2B - Upper Floors	Concrete
2 - Superstructure	2B - Upper Floors	Form Work
2 - Superstructure	2B - Upper Floors	Reinforcement; all diameters
2 - Superstructure	2C - Roof	Concrete; 180mm thick suspended
2 - Superstructure	2C - Roof	Form Work; to soffit of solid slab
2 - Superstructure	2C - Roof	Reinforcement; all diameters
2 - Superstructure	2E - External Walls	Block work walls; 200mm thick; insulated
2 - Superstructure	2E - External Walls	Yellow terracotta tiles; 300x600; to external block work walls
2 - Superstructure	2E - External Walls	Repair Allowance
2 - Superstructure	2E - External Walls	Aluminium frame with double tinted tempered glazing-including door
2 - Superstructure	2E - External Walls	Replace seals
2 - Superstructure	2E - External Walls	Replace glazed units
2 - Superstructure	2F - Windows and External Doors	Metal Panel Door incl ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Metal Panel Door incl ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 -	2F - Windows and	Metal Panel Door incl ironmongery

BCIS Structure		Element Description
Superstructure	External Doors	
2 - Superstructure	2F - Windows and External Doors	Replace seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2C - Roof	Red roofing ceramic tiles
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	Roof waterproofing membrane
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	50mm Insulation
2 - Superstructure	2G - Internal Walls and Partitions	150mm Internal block work walls
2 - Superstructure	2H - Internal Doors	Solid Core wood stained with closer
2 - Superstructure	2H - Internal Doors	Replace Seals
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
3 - Finishes	3A - Wall Finishes	Plastering to walls
3 - Finishes	3A - Wall Finishes	Semi gloss paint
3 - Finishes	3A - Wall Finishes	Repaint
3 - Finishes	3B - Floor Finishes	Terrazzo
3 - Finishes	3B - Floor Finishes	Ceramic Tiles
3 - Finishes	3C - Ceiling Finishes	Gypsum Ceiling
3 - Finishes	3C - Ceiling Finishes	Repair Allowance
5 - Mechanical and Electrical	5A - Sanitary Appliances	WC's floor type
5 - Mechanical and Electrical	5A - Sanitary Appliances	Shower trays (inc. shower rose)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Wash basins (inc. taps)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Toilet paper holder
5 - Mechanical and Electrical	5A - Sanitary Appliances	Soap dish's
5 - Mechanical and Electrical	5A - Sanitary Appliances	Mirrors
5 - Mechanical and Electrical	5A - Sanitary Appliances	Rope hook
5 - Mechanical and Electrical	5D - Water Installations	Domestic Water Distribution
5 - Mechanical and Electrical	5D - Water Installations	Replacement Allowance
5 - Mechanical and Electrical	5A - Sanitary Appliances	Sanitary Waste
5 - Mechanical and Electrical	5A - Sanitary Appliances	Replacement Allowance
5 - Mechanical and Electrical	5C - Disposal Installations	Rain Water Drainage
5 - Mechanical and Electrical	5C - Disposal Installations	Replacement Allowance
5 - Mechanical	5C - Disposal	Other Plumbing Systems

BCIS Structure		Element Description
and Electrical	Installations	
5 - Mechanical and Electrical	5C - Disposal Installations	Replacement Allowance
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Distribution System
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Replacement Allowance
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Terminal & Package Units - allowance for package replacement
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Replacement Allowance for terminal unit
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Controls & Instrumentation
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Systems Testing and Balancing
5 - Mechanical and Electrical	5H - Electrical Installations	Electrical Services Distribution
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5H - Electrical Installations	Lighting & Branch Wiring
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5L - Communication Installations	Communication & Security
5 - Mechanical and Electrical	5L - Communication Installations	Replacement Allowance
4 - Fittings and Furnishings	4 - Fittings and Furnishings	Fit out of kitchen area
4 - Fittings and Furnishings	4 - Fittings and Furnishings	Repair Allowance
8 - Externals	6D - Minor Building Works	Underground Water Tank

Indoor Swimming Pool

Clear cells indicate Component Replacement. Cells in grey indicate a Sub-Component Replacement.

BCIS Structure		Element Description
1 - Substructure	1 - Substructure	Concrete
1 - Substructure	1 - Substructure	Earth works
1 - Substructure	1 - Substructure	Form Work
1 - Substructure	1 - Substructure	Reinforcement
1 - Substructure	1 - Substructure	Waterproofing
1 - Substructure	1 - Substructure	Solid blockwork (200mm thick)
1 - Substructure	1 - Substructure	Concrete; 100mm thick floor slab
1 - Substructure	1 - Substructure	Fabric Reinforcement
1 - Substructure	1 - Substructure	Waterproofing/ DPM
1 - Substructure	1 - Substructure	Concrete; 300mm thick concrete slab
2 - Superstructure	2B - Upper Floors	Form Work
2 - Superstructure	2B - Upper Floors	Reinforcement; all diameters
2 - Superstructure	2C - Roof	Concrete; 200mm thick suspended
2 - Superstructure	2C - Roof	Form Work; to soffit of solid slab
2 - Superstructure	2C - Roof	Reinforcement; all diameters
2 - Superstructure	2C - Roof	MS Steel Roof Construction
2 - Superstructure	2E - External Walls	Blockwork walls; 400mm thick insulated
2 - Superstructure	2E - External Walls	Cast stone walling on structural frame
2 - Superstructure	2E - External Walls	Repair Allowance
2 - Superstructure	2E - External Walls	Plastering to concrete walls
2 - Superstructure	2E - External Walls	Weather shield paint on plastered walls
2 - Superstructure	2F - Windows and External Doors	Double glazed turn and tilt type inc frame and ironmongery 900mm x 2300mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Aluminum framed double glazing system. Including 2 glazed doors
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Aluminum framed double glazing system. Including 4 glazed doors
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed tempered glazed with powder coated aluminum inc frame and ironmongery

BCIS Structure		Element Description
		1500mmx2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed tempered glazed with powder coated aluminum inc frame and ironmongery 2000mmx2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed tempered glazed with powder coated aluminum inc frame and ironmongery 3100mmx2800mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Revolve door (dia 5.0 x 2.80m high)
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Sliding door (4.9 x 2.10m size)
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2C - Roof	Profiled aluminum roofing cover including insulation
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	Large format rooflight with SS external louvers
2 - Superstructure	2C - Roof	Replace Seals
2 - Superstructure	2C - Roof	Replace Ironmongery
2 - Superstructure	2C - Roof	Replace Sealed Glazed Units
2 - Superstructure	2C - Roof	Structural glass circulation link with proprietary aluminum brics soleil
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	50mm insulation to flat roof
2 - Superstructure	2G - Internal Walls and Partitions	100mm Internal block work walls
2 - Superstructure	2G - Internal Walls and Partitions	400mm Internal block work walls
2 - Superstructure	2H - Internal Doors	Solid core, timber veneered door, wood frame, including all ironmongery 900mmx2100mm
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Solid core, timber veneered door, wood frame, including all ironmongery 2000mmx2100mm
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Aluminum sliding doors 3900mmx2100mm
2 - Superstructure	2H - Internal Doors	Replacement Allowance

BCIS Structure		Element Description
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Aluminum sliding doors 1500mmx2100mm
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Aluminum sliding doors 5700mmx2100mm
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Aluminum sliding doors 9800mmx2400mm
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Glazed Partition
2 - Superstructure	2H - Internal Doors	Repair Allowance
2 - Superstructure	2H - Internal Doors	Internal Windows Double glazed, operable turn and tilted windows; including all ironmongery 4800mmx1200mm
2 - Superstructure	2H - Internal Doors	Replace Seals
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Replace Sealed Glazed Units
2 - Superstructure	2H - Internal Doors	Internal Windows Double glazed, operable turn and tilted windows; including all ironmongery 1200mmx1200mm
2 - Superstructure	2H - Internal Doors	Replace Seals
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Replace Sealed Glazed Units
4 - Fittings and Furnishings	4 - Fittings and Furnishings	WC cubicles (2000mmx1000mm size)
2 - Superstructure	2D - Stairs	Teak slated screens
2 - Superstructure	2D - Stairs	Changing cubicles
3 - Finishes	3A - Wall Finishes	Plastering to walls
3 - Finishes	3A - Wall Finishes	Semi gloss paint
3 - Finishes	3A - Wall Finishes	Repaint
3 - Finishes	3A - Wall Finishes	Ceramic tiles
3 - Finishes	3A - Wall Finishes	Sealed teak veneered plywood finish
3 - Finishes	3B - Floor Finishes	Terrazzo tiling
3 - Finishes	3B - Floor Finishes	Ceramic tiles
3 - Finishes	3B - Floor Finishes	Cut and polished concrete floor
3 - Finishes	3C - Ceiling Finishes	Suspended metal ceiling
3 - Finishes	3C - Ceiling Finishes	Repair Allowance
3 - Finishes	3C - Ceiling Finishes	1200mmx2400mm teak veneer ply ceiling
5 - Mechanical and Electrical	5A - Sanitary Appliances	WC's floor type
5 - Mechanical and Electrical	5A - Sanitary Appliances	Mirrors (2.6m x 0.8m size)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Mirrors (1.1m x 0.8m size)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Shower trays (inc. shower rose)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Wash basins (inc. taps)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Wash basins (inc. taps and 0.5mx0.4m size vanity unit)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Toilet paper holder
5 - Mechanical and Electrical	5A - Sanitary Appliances	Soap dish's
5 - Mechanical and Electrical	5A - Sanitary Appliances	Urinals

BCIS Structure		Element Description
5 - Mechanical and Electrical	5D - Water Installations	Domestic Water Distribution
5 - Mechanical and Electrical	5D - Water Installations	Replacement Allowance
5 - Mechanical and Electrical	5A - Sanitary Appliances	Sanitary Waste
5 - Mechanical and Electrical	5A - Sanitary Appliances	Replacement Allowance
5 - Mechanical and Electrical	5C - Disposal Installations	Rain Water Drainage
5 - Mechanical and Electrical	5C - Disposal Installations	Replacement Allowance
5 - Mechanical and Electrical	5C - Disposal Installations	Other Plumbing Systems
5 - Mechanical and Electrical	5C - Disposal Installations	Replacement Allowance
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Distribution System
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Replacement Allowance
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Terminal & Package Units - allowance for package replacement
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Replacement Allowance for terminal unit
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Controls & Instrumentation
5 - Mechanical and Electrical	5H - Electrical Installations	Electrical Services Distribution
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5H - Electrical Installations	Lighting & Branch Wiring
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5L - Communication Installations	Communication & Security
5 - Mechanical and Electrical	5L - Communication Installations	Replacement Allowance
8 - Externals	6D - Minor Building Works	Earthworks, Pool
8 - Externals	6D - Minor Building Works	Concrete, Pool
8 - Externals	6D - Minor Building Works	Form Work, Pool
8 - Externals	6D - Minor Building Works	Reinforcement, Pool
8 - Externals	6D - Minor Building Works	Waterproofing, Pool
8 - Externals	6D - Minor Building Works	Ceramic tiles to pool
8 - Externals	6D - Minor Building	Ceramic tiles to pool, Pool, deck

BCIS Structure		Element Description
	Works	
8 - Externals	6D - Minor Building Works	Water treatment/filtration, sterilizer dosing
8 - Externals	6D - Minor Building Works	Replacement Allowance

Shopping Centre

Clear cells indicate Component Replacement. Cells in grey indicate a Sub-Component Replacement.

BCIS Structure		Element Description
1 - Substructure	1 - Substructure	Concrete
1 - Substructure	1 - Substructure	Earth works
1 - Substructure	1 - Substructure	Form Work
1 - Substructure	1 - Substructure	Reinforcement
1 - Substructure	1 - Substructure	Waterproofing
1 - Substructure	1 - Substructure	Concrete; 100mm thick slab;
1 - Substructure	1 - Substructure	Fabric Reinforcement
1 - Substructure	1 - Substructure	Waterproofing/ DPM
2 - Superstructure	2B - Upper Floors	Concrete
2 - Superstructure	2B - Upper Floors	Form Work
2 - Superstructure	2B - Upper Floors	Reinforcement; all diameters
2 - Superstructure	2B - Upper Floors	100mm composite slab on steel girders including metal deck
2 - Superstructure	2B - Upper Floors	203x203mm Steel Columns
2 - Superstructure	2C - Roof	Concrete; 200mm thick suspended
2 - Superstructure	2C - Roof	Concrete drop beams
2 - Superstructure	2C - Roof	Form Work; to soffit of solid slab
2 - Superstructure	2C - Roof	Reinforcement; all diameters
2 - Superstructure	2C - Roof	200x400mm Ribbed Slab @800cc
2 - Superstructure	2C - Roof	100mm composite slab on steel girders including metal deck
2 - Superstructure	2C - Roof	Steel trussed roof structure
2 - Superstructure	2E - External Walls	Block work walls; 200mm thick; insulated
2 - Superstructure	2E - External Walls	Yellow terracotta tiles; 300x600; to external block work walls
2 - Superstructure	2E - External Walls	Repair Allowance
2 - Superstructure	2F - Windows and External Doors	Double glazed turn & tilt type 8000mmx2400mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed turn & tilt type 13000mmx2400mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed turn & tilt type 17000mmx2400mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and	Replace Ironmongery

BCIS Structure		Element Description
	External Doors	
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed turn & tilt type 41000mmx2400mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed tempered glazed with powder coated Aluminum 1000mmx2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed tempered glazed with powder coated Aluminum 2000mmx2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double wire steel door with Louver ventilation 2000x2100mm
2 - Superstructure	2F - Windows and External Doors	Replace seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2C - Roof	Red roofing ceramic tiles
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	Cement Tiles on Flat Roof
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	Roof waterproofing membrane
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	50mm Insulation
2 - Superstructure	2C - Roof	Metal Profile sheet roofing including insulation
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2G - Internal Walls and Partitions	150mm Internal block work walls
2 - Superstructure	2H - Internal Doors	Double glazed tempered with powder coated aluminum 1000x2100mm
2 - Superstructure	2H - Internal Doors	Replace Seals
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Replace Sealed Glazed Units
2 - Superstructure	2H - Internal Doors	Vault Doors to Strong rooms
2 - Superstructure	2H - Internal Doors	Replace Seals
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2D - Stairs	Concrete
2 - Superstructure	2D - Stairs	Form Work
2 - Superstructure	2D - Stairs	Reinforcement; all diameters
2 - Superstructure	2D - Stairs	Hand railing and Balustrade
3 - Finishes	3A - Wall Finishes	Self Finish Blockwork

BCIS Structure		Element Description
3 - Finishes	3A - Wall Finishes	Plastering to walls
3 - Finishes	3A - Wall Finishes	Semi gloss paint
3 - Finishes	3A - Wall Finishes	Repaint
3 - Finishes	3B - Floor Finishes	Self Finish Concrete
3 - Finishes	3B - Floor Finishes	Repair Allowance
3 - Finishes	3C - Ceiling Finishes	Self Finish Concrete
3 - Finishes	3C - Ceiling Finishes	Repair Allowance
5 - Mechanical and Electrical	5J - Lift Installations	Escalator Set 12m long; two way 1m wide inc all mechanical and electrical accessories
5 - Mechanical and Electrical	5J - Lift Installations	Replacement Allowance
5 - Mechanical and Electrical	5J - Lift Installations	Repair Allowance
5 - Mechanical and Electrical	5D - Water Installations	Domestic Water Distribution
5 - Mechanical and Electrical	5D - Water Installations	Replacement Allowance
5 - Mechanical and Electrical	5A - Sanitary Appliances	Sanitary Waste
5 - Mechanical and Electrical	5A - Sanitary Appliances	Replacement Allowance
5 - Mechanical and Electrical	5C - Disposal Installations	Rain Water Drainage
5 - Mechanical and Electrical	5C - Disposal Installations	Replacement Allowance
5 - Mechanical and Electrical	5C - Disposal Installations	Other Plumbing Systems
5 - Mechanical and Electrical	5C - Disposal Installations	Replacement Allowance
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Distribution System
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Replacement Allowance
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Terminal & Package Units - allowance for package replacement
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Replacement Allowance for terminal unit
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Controls & Instrumentation
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Systems Testing and Balancing
5 - Mechanical and Electrical	5H - Electrical Installations	Electrical Services Distribution
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5H - Electrical Installations	Lighting & Branch Wiring
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and	5L - Communication	Communication & Security

BCIS Structure		Element Description
Electrical	Installations	
5 - Mechanical and Electrical	5L - Communication Installations	Replacement Allowance
6 - Externals	6.A - Site Works	Assumed minimal site clearance and level site
6 - Externals	6.A - Site Works	Interlocking paving; tile paving, lawn; shade canopy trees, palm trees, flowering accent; hedging; perimeter wall; all as per landscaping drawing
6 - Externals	6.A - Site Works	Walling
6 - Externals	6.A - Site Works	Landscaping
6 - Externals	6.A - Site Works	Tile paving
6 - Externals	6.A - Site Works	Canopies 6m wide with ACP cladding including walkway with accent paving
6 - Externals	6.A - Site Works	Repair Allowance
6 - Externals	6.A - Site Works	Steel Galvanized painted framing covered by single tempered laminated glass
6 - Externals	6.A - Site Works	Repair Allowance

Restaurants

Clear cells indicate Component Replacement. Cells in grey indicate a Sub-Component Replacement.

BCIS Structure		Element Description
1 - Substructure	1 - Substructure	Concrete
1 - Substructure	1 - Substructure	Earth works
1 - Substructure	1 - Substructure	Form Work
1 - Substructure	1 - Substructure	Reinforcement
1 - Substructure	1 - Substructure	Waterproofing
1 - Substructure	1 - Substructure	Concrete; 100mm thick slab;
1 - Substructure	1 - Substructure	Fabric Reinforcement
1 - Substructure	1 - Substructure	Waterproofing/ DPM
2 - Superstructure	2B - Upper Floors	Concrete
2 - Superstructure	2B - Upper Floors	Form Work
2 - Superstructure	2B - Upper Floors	Reinforcement; all diameters
2 - Superstructure	2C - Roof	Concrete; 200mm thick suspended
2 - Superstructure	2C - Roof	Form Work; to soffit of solid slab
2 - Superstructure	2C - Roof	Reinforcement; all diameters
2 - Superstructure	2C - Roof	200x400mm Ribbed Slab @800cc
2 - Superstructure	2E - External Walls	Block work walls; 200mm thick; insulated
2 - Superstructure	2E - External Walls	Yellow terracotta tiles; 300x600; to external block work walls
2 - Superstructure	2E - External Walls	Repair Allowance
2 - Superstructure	2F - Windows and External Doors	10mm Tempered glass with powder coated aluminum frame and ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Ceramic Louvers
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Double glazed tempered glazed with powder coated Aluminum 1800mmx2800mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed tempered glazed with powder coated Aluminum 1050mmx2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery

BCIS Structure		Element Description
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2C - Roof	Red roofing ceramic tiles
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	Roof waterproofing membrane
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	50mm Insulation
2 - Superstructure	2G - Internal Walls and Partitions	150mm Internal block work walls
2 - Superstructure	2H - Internal Doors	Solid Core wood stained w/closer. Single door
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2D - Stairs	Concrete
2 - Superstructure	2D - Stairs	Form Work
2 - Superstructure	2D - Stairs	Reinforcement; all diameters
2 - Superstructure	2D - Stairs	Hand railing and Balustrade
3 - Finishes	3A - Wall Finishes	Self Finish Blockwork
3 - Finishes	3A - Wall Finishes	Repair Allowance
3 - Finishes	3B - Floor Finishes	Self Finish Concrete
3 - Finishes	3B - Floor Finishes	Repair Allowance
3 - Finishes	3B - Floor Finishes	Interlocking Tiles
3 - Finishes	3B - Floor Finishes	Repair Allowance
3 - Finishes	3C - Ceiling Finishes	Self Finish Concrete sophist
3 - Finishes	3C - Ceiling Finishes	Repair Allowance
5 - Mechanical and Electrical	5D - Water Installations	Domestic Water Distribution
5 - Mechanical and Electrical	5D - Water Installations	Replacement Allowance
5 - Mechanical and Electrical	5A - Sanitary Appliances	Sanitary Waste
5 - Mechanical and Electrical	5A - Sanitary Appliances	Replacement Allowance
5 - Mechanical and Electrical	5C - Disposal Installations	Rain Water Drainage
5 - Mechanical and Electrical	5C - Disposal Installations	Replacement Allowance
5 - Mechanical and Electrical	5C - Disposal Installations	Other Plumbing Systems
5 - Mechanical and Electrical	5C - Disposal Installations	Replacement Allowance
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Distribution System
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Replacement Allowance
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Terminal & Package Units - allowance for package replacement
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Replacement Allowance for terminal unit
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Controls & Instrumentation
5 - Mechanical and Electrical	5H - Electrical Installations	Electrical Services Distribution
5 - Mechanical and	5H - Electrical	Replacement Allowance

BCIS Structure		Element Description
Electrical	Installations	
5 - Mechanical and Electrical	5H - Electrical Installations	Lighting & Branch Wiring
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5L - Communication Installations	Communication & Security
5 - Mechanical and Electrical	5L - Communication Installations	Replacement Allowance
6 - Externals	6A - Site Works	Assumed minimal site clearance and level site
6 - Externals	6A - Site Works	Interlocking paving; tile paving, lawn; shade canopy trees, palm trees, flowering accent; hedging; perimeter wall; all as per landscaping drawing
6 - Externals	6A - Site Works	Walling
6 - Externals	6A - Site Works	Landscaping
6 - Externals	6A - Site Works	Tile paving

Private School

Clear cells indicate Component Replacement. Cells in grey indicate a Sub-Component Replacement.

BCIS Structure		Element Description
1 - Substructure	1 - Substructure	Concrete
1 - Substructure	1 - Substructure	Earth works
1 - Substructure	1 - Substructure	Form Work
1 - Substructure	1 - Substructure	Reinforcement
1 - Substructure	1 - Substructure	Waterproofing
1 - Substructure	1 - Substructure	Concrete; 100mm thick floor slab
1 - Substructure	1 - Substructure	Fabric Reinforcement
1 - Substructure	1 - Substructure	Waterproofing/ DPM
2 - Superstructure	2B - Upper Floors	Concrete; 200mm thick.
2 - Superstructure	2B - Upper Floors	Form Work
2 - Superstructure	2B - Upper Floors	Reinforcement; all diameters
2 - Superstructure	2C - Roof	Concrete; 200mm thick suspended
2 - Superstructure	2C - Roof	Concrete, Beams
2 - Superstructure	2C - Roof	Form Work; to soffit of solid slab
2 - Superstructure	2C - Roof	Reinforcement; all diameters
2 - Superstructure	2C - Roof	Ribbed Slab (160m x 750m @ 1000c/c)
2 - Superstructure	2C - Roof	50 x 200mm Timber Pergola (300mm c/c)
2 - Superstructure	2C - Roof	Replacement Allowance
2 - Superstructure	2E - External Walls	Block work walls; 200mm thick; insulated
2 - Superstructure	2E - External Walls	Block work walls; 300mm thick; insulated
2 - Superstructure	2E - External Walls	Cast Stone Walling on structural framework
2 - Superstructure	2E - External Walls	Textured Cast Stone Feature walling on structural frame
2 - Superstructure	2E - External Walls	Insitu Concrete Walling
2 - Superstructure	2E - External Walls	Insitu Concrete Walling (Portland White) behind HW timber louvers
2 - Superstructure	2E - External Walls	Replacement Allowance for HW Timber Louvers
2 - Superstructure	2E - External Walls	Aluminum framed double glazing system behind HW timber louvers
2 - Superstructure	2E - External Walls	Replacement Allowance for HW Timber Louvers
2 - Superstructure	2F - Windows and External Doors	Double glazed turn & tilt type 1000mmx5000mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed turn & tilt type 800mmx800mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and	Double glazed tempered glazed with powder coated

BCIS Structure		Element Description
	External Doors	Aluminum 3600mmx2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed tempered glazed with powder coated Aluminum 1800 x 2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double Glazed tempered glazed with powder coated aluminum 1000mm x 1800mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2C - Roof	Cement tiles laid flat on roof
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	Roof waterproofing membrane
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	50mm Insulation
2 - Superstructure	2C - Roof	Profiled Aluminum roofing cover including insulation
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	Glazed roof with supporting frame
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2G - Internal Walls and Partitions	100mm Internal block work walls
2 - Superstructure	2G - Internal Walls and Partitions	150mm Internal block work walls
2 - Superstructure	2G - Internal Walls and Partitions	300mm Internal block work walls
2 - Superstructure	2G - Internal Walls and Partitions	Fixed Glazed including Aluminum
2 - Superstructure	2G - Internal Walls and Partitions	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Solid core timber veneered; wood frame; including all ironmongery 900 x 2100mm
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Solid core timber veneered; wood frame; including all ironmongery 1800 x 2800mm
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Solid Core Timber veneered: wood frame, including all ironmongery 1050 x 2100mm
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2D - Stairs	Concrete
2 - Superstructure	2D - Stairs	Form Work
2 - Superstructure	2D - Stairs	Reinforcement; all diameters

BCIS Structure		Element Description
2 - Superstructure	2D - Stairs	Hand railing and Balustrades
2 - Superstructure	2D - Stairs	Repair Allowance
3 - Finishes	3A - Wall Finishes	Plastering to walls
3 - Finishes	3A - Wall Finishes	Semi gloss paint
3 - Finishes	3A - Wall Finishes	Repaint
3 - Finishes	3A - Wall Finishes	Ceramic tiles
3 - Finishes	3A - Wall Finishes	Fair faced finish to block walls
3 - Finishes	3A - Wall Finishes	Repair Allowance
3 - Finishes	3A - Wall Finishes	Teak Veneered ply lining on block wall
3 - Finishes	3A - Wall Finishes	Repair Allowance
3 - Finishes	3A - Wall Finishes	Painted Grade Blockwork
3 - Finishes	3A - Wall Finishes	Repaint
3 - Finishes	3B - Floor Finishes	Terrazzo
3 - Finishes	3B - Floor Finishes	HW Spring Sports Floor
3 - Finishes	3B - Floor Finishes	Repair Allowance
3 - Finishes	3B - Floor Finishes	Ceramic; to toilet, kitchen and laundry areas
3 - Finishes	3B - Floor Finishes	Sealed, Exposed Concrete Floor
3 - Finishes	3B - Floor Finishes	Resealant Allowance
3 - Finishes	3B - Floor Finishes	Teak Hardwood Decking 30 x 300mm HW Planks
3 - Finishes	3B - Floor Finishes	Repair Allowance
3 - Finishes	3C - Ceiling Finishes	Suspended metal ceiling
3 - Finishes	3C - Ceiling Finishes	Repair Allowance
3 - Finishes	3C - Ceiling Finishes	1200 x 2400mm teak veneer ply linings on suspended ceiling frame
3 - Finishes	3C - Ceiling Finishes	Repair Allowance
3 - Finishes	3C - Ceiling Finishes	Acoustic Plasterboard on MS Frame
3 - Finishes	3C - Ceiling Finishes	Repair Allowance
5 - Mechanical and Electrical	5A - Sanitary Appliances	WC's floor type
5 - Mechanical and Electrical	5A - Sanitary Appliances	Bath tub (inc. shower rose)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Shower trays (inc. shower rose)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Wash basins (inc. taps)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Wash basins (inc. taps and 600mm x 400mm vanity tops)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Toilet paper holder
5 - Mechanical and Electrical	5A - Sanitary Appliances	Soap dish's
5 - Mechanical and Electrical	5A - Sanitary Appliances	Mirrors 1400mm x 800mm
5 - Mechanical and Electrical	5A - Sanitary Appliances	Mirrors 800mm x 800mm
5 - Mechanical and Electrical	5A - Sanitary Appliances	Rope hook
5 - Mechanical and Electrical	5A - Sanitary Appliances	Urinals
5 - Mechanical and Electrical	5D - Water Installations	Domestic Water Distribution
5 - Mechanical and Electrical	5D - Water Installations	Replacement Allowance
5 - Mechanical and Electrical	5A - Sanitary Appliances	Sanitary Waste
5 - Mechanical and Electrical	5A - Sanitary Appliances	Replacement Allowance

BCIS Structure		Element Description
5 - Mechanical and Electrical	5C - Disposal Installations	Rain Water Drainage
5 - Mechanical and Electrical	5C - Disposal Installations	Replacement Allowance
5 - Mechanical and Electrical	5C - Disposal Installations	Other Plumbing Systems
5 - Mechanical and Electrical	5C - Disposal Installations	Replacement Allowance
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Distribution System
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Replacement Allowance
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Terminal & Package Units -allowance for package replacement
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Replacement Allowance for terminal unit
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Controls & Instrumentation
5 - Mechanical and Electrical	5H - Electrical Installations	Electrical Services Distribution
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5H - Electrical Installations	Lighting & Branch Wiring
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5L - Communication Installations	Communication & Security
5 - Mechanical and Electrical	5L - Communication Installations	Replacement Allowance
4 - Fittings and Furnishings	4 - Fittings and Furnishings	Fit out of Kitchen area; all units and associated ironmongery and accessories;
6 - Externals	6A - Site Works	Assumed minimal site clearance and level site
6 - Externals	6A - Site Works	General Allowance for leveling
6 - Externals	6A - Site Works	Interlocking paving; tile paving, lawn; shade canopy trees, palm trees, flowering accent; hedging; perimeter wall; all as per landscaping drawing
6 - Externals	6A - Site Works	Walling
6 - Externals	6A - Site Works	Landscaping
6 - Externals	6A - Site Works	Tile paving

Petting Zoo

Clear cells indicate Component Replacement. Cells in grey indicate a Sub-Component Replacement.

BCIS Structure		Element Description
1 - Substructure	1 - Substructure	Concrete
1 - Substructure	1 - Substructure	Earth works
1 - Substructure	1 - Substructure	Form Work
1 - Substructure	1 - Substructure	Reinforcement
1 - Substructure	1 - Substructure	Waterproofing
1 - Substructure	1 - Substructure	Concrete; 100mm thick floor slab
1 - Substructure	1 - Substructure	Fabric Reinforcement
1 - Substructure	1 - Substructure	Waterproofing/ DPM
2 - Superstructure	2B - Upper Floors	Concrete; 200mm thick.
2 - Superstructure	2B - Upper Floors	Form Work
2 - Superstructure	2B - Upper Floors	Reinforcement; all diameters
2 - Superstructure	2C - Roof	Concrete; 200mm thick suspended
2 - Superstructure	2C - Roof	Form Work; to soffit of solid slab
2 - Superstructure	2C - Roof	Reinforcement; all diameters
2 - Superstructure	2C - Roof	Ribbed Slab (200 x 350mm @ 1000c/c)
2 - Superstructure	2C - Roof	Structural Steel
2 - Superstructure	2E - External Walls	Block work walls; 300mm thick; insulated
2 - Superstructure	2E - External Walls	Yellow terracotta tiles; 300x600; Sannini System to external block work walls
2 - Superstructure	2E - External Walls	Repair Allowance
2 - Superstructure	2E - External Walls	Parapets Concrete: 200mm thick
2 - Superstructure	2E - External Walls	Form work
2 - Superstructure	2E - External Walls	Reinforcement
2 - Superstructure	2F - Windows and External Doors	Fixed Wire Windows 4000 x 2000mm
2 - Superstructure	2F - Windows and External Doors	Repair Allowance
2 - Superstructure	2F - Windows and External Doors	Fixed Wire Windows 4000 x 2000mm
2 - Superstructure	2F - Windows and External Doors	Repair Allowance
2 - Superstructure	2F - Windows and External Doors	Solid core wood stained with closer; wood frame; including all ironmongery; 2000 x 2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Solid core wood stained with closer; wood frame; including all ironmongery; 1000 x 2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Hard Wood Doors-operable both sides
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Frameless Double Glazed Doors

BCIS Structure		Element Description
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2C - Roof	Red roofing ceramic tiles
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	Roof waterproofing membrane
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	50mm Insulation
2 - Superstructure	2C - Roof	Fabric Roof Covering including S/S Cabe System
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2G - Internal Walls and Partitions	200mm Internal block work walls
2 - Superstructure	2G - Internal Walls and Partitions	Hardwood partitions
2 - Superstructure	2G - Internal Walls and Partitions	Repair Allowance
2 - Superstructure	2G - Internal Walls and Partitions	Fixed Wire INTERIOR Windows 4000 x 2000mm
2 - Superstructure	2G - Internal Walls and Partitions	Repair Allowance
2 - Superstructure	2H - Internal Doors	Solid Hard Wood Doors-including frame and ironmongery 2000 x 1500mm
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Solid core wood stained w/closer 1000x 2100mm
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Solid core wood stained w/closer 2000x 2100mm
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Steel Doors including Frame and Ironmongery 2000x2100mm
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Revolving doors
2 - Superstructure	2H - Internal Doors	Repair Allowance
3 - Finishes	3A - Wall Finishes	Plastering to walls
3 - Finishes	3A - Wall Finishes	Semi gloss paint
3 - Finishes	3A - Wall Finishes	Repaint
3 - Finishes	3A - Wall Finishes	Ceramic tiles
3 - Finishes	3B - Floor Finishes	Stone Finish
3 - Finishes	3B - Floor Finishes	Ceramic Tiles
3 - Finishes	3B - Floor Finishes	Terrazzo
3 - Finishes	3C - Ceiling Finishes	Suspended metal ceiling
3 - Finishes	3C - Ceiling Finishes	Repair Allowance
3 - Finishes	3C - Ceiling Finishes	Gypsum ceiling including painting
3 - Finishes	3C - Ceiling Finishes	Repair Allowance
3 - Finishes	3C - Ceiling Finishes	Repaint Allowance
3 - Finishes	3C - Ceiling Finishes	Self finished concrete slab
5 - Mechanical and Electrical	5A - Sanitary Appliances	WC's floor type
5 - Mechanical and Electrical	5A - Sanitary Appliances	Bath tub (inc. shower rose)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Shower trays (inc. shower rose)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Shower trays (inc. shower rose)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Wash basins (inc. taps)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Wash basins (inc. taps)
5 - Mechanical and	5A - Sanitary	Toilet paper holder

BCIS Structure		Element Description
Electrical	Appliances	
5 - Mechanical and Electrical	5A - Sanitary Appliances	Toilet paper holder
5 - Mechanical and Electrical	5A - Sanitary Appliances	Soap dish's
5 - Mechanical and Electrical	5A - Sanitary Appliances	Rope hook
5 - Mechanical and Electrical	5D - Water Installations	Domestic Water Distribution
5 - Mechanical and Electrical	5D - Water Installations	**Replacement Allowance**
5 - Mechanical and Electrical	5A - Sanitary Appliances	Sanitary Waste
5 - Mechanical and Electrical	5A - Sanitary Appliances	**Replacement Allowance**
5 - Mechanical and Electrical	5C - Disposal Installations	Rain Water Drainage
5 - Mechanical and Electrical	5C - Disposal Installations	**Replacement Allowance**
5 - Mechanical and Electrical	5C - Disposal Installations	Other Plumbing Systems
5 - Mechanical and Electrical	5C - Disposal Installations	**Replacement Allowance**
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Distribution System
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	**Replacement Allowance**
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Terminal & Package Units - allowance for package replacement
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	**Replacement Allowance for terminal unit**
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Controls & Instrumentation
5 - Mechanical and Electrical	5C - Disposal Installations	Systems Testing and Balancing
5 - Mechanical and Electrical	5H - Electrical Installations	Electrical Services Distribution
5 - Mechanical and Electrical	5H - Electrical Installations	**Replacement Allowance**
5 - Mechanical and Electrical	5H - Electrical Installations	Lighting & Branch Wiring
5 - Mechanical and Electrical	5H - Electrical Installations	**Replacement Allowance**
5 - Mechanical and Electrical	5H - Electrical Installations	**Replacement Allowance**
5 - Mechanical and Electrical	5L - Communication Installations	Communication & Security
5 - Mechanical and Electrical	5L - Communication Installations	**Replacement Allowance**
4 - Fittings and Furnishings	4 - Fittings and Furnishings	Central Reception Desk
4 - Fittings and Furnishings	4 - Fittings and Furnishings	**Repair Allowance**

BCIS Structure		Element Description
4 - Fittings and Furnishings	4 - Fittings and Furnishings	Pantry Counter
4 - Fittings and Furnishings	4 - Fittings and Furnishings	Repair Allowance
6 - Externals	6A - Site Works	Assumed minimal site clearance and level site
6 - Externals	6A - Site Works	Site Earthworks
6 - Externals	6A - Site Works	Precast concrete interlocking pavers; 100 x 200mm
6 - Externals	6A - Site Works	Repair Allowance
6 - Externals	6A - Site Works	Accent Paving
6 - Externals	6A - Site Works	Repair Allowance
6 - Externals	6A - Site Works	Pedestrian Paving
6 - Externals	6A - Site Works	Repair Allowance
6 - Externals	6A - Site Works	Chain Link fence
6 - Externals	6A - Site Works	Repair Allowance
6 - Externals	6A - Site Works	Repair Allowance Lighting
6 - Externals	6A - Site Works	Repair Allowance Irrigation
8 - Externals	6D - Minor Building Works	Shade House 2 NR
8 - Externals	6D - Minor Building Works	Green House 2 NR

Convention Centre

Clear cells indicate Component Replacement. Cells in grey indicate a Sub-Component Replacement.

BCIS Structure		Element Description
1 - Substructure	1 - Substructure	Concrete
1 - Substructure	1 - Substructure	Earth works
1 - Substructure	1 - Substructure	Form Work
1 - Substructure	1 - Substructure	Reinforcement
1 - Substructure	1 - Substructure	Waterproofing
1 - Substructure	1 - Substructure	200mm Solid Block Work
1 - Substructure	1 - Substructure	Concrete; 150mm thick floor slab
1 - Substructure	1 - Substructure	Fabric Reinforcement
1 - Substructure	1 - Substructure	Waterproofing/ DPM
2 - Superstructure	2B - Upper Floors	Concrete
2 - Superstructure	2B - Upper Floors	Concrete column beam and walls
2 - Superstructure	2B - Upper Floors	Form Work
2 - Superstructure	2B - Upper Floors	Reinforcement; all diameters
2 - Superstructure	2B - Upper Floors	Ribbed Slab 750mm deep including formwork
2 - Superstructure	2B - Upper Floors	Structural Steel Work, excluding all base plates, angle cleats etc…
2 - Superstructure	2C - Roof	Concrete; 300mm thick suspended
2 - Superstructure	2C - Roof	Form Work; to soffit of solid slab
2 - Superstructure	2C - Roof	Reinforcement; all diameters
2 - Superstructure	2C - Roof	Roof structural steel frame (excluding all base plates, angle cleats, etc…)
2 - Superstructure	2E - External Walls	Block work walls; 300mm thick; insulated
2 - Superstructure	2E - External Walls	200mm insulated block walls
2 - Superstructure	2E - External Walls	Fair faced casing to Galvanized MS Columns, 300mm dia, 10.6m height (column measured in structural steel)
2 - Superstructure	2E - External Walls	Fair faced casing to Galvanized MS Columns, 300mm dia, 7m height (column measured in structural steel)
2 - Superstructure	2E - External Walls	Fair faced casing to Galvanized MS Columns, 300mm dia, 4.5m height (column measured in structural steel)
2 - Superstructure	2E - External Walls	Cast stone walling on structural frame
2 - Superstructure	2E - External Walls	Cement and Sand rendering (Portland White)
2 - Superstructure	2E - External Walls	Repair Rendering
2 - Superstructure	2E - External Walls	Translucent, profiled glazing system
2 - Superstructure	2E - External Walls	Repair Glazing System
2 - Superstructure	2F - Windows and External Doors	Aluminum Framed Double Glazed turn 3000 x 1500mm
2 - Superstructure	2E - External Walls	Replace Seals
2 - Superstructure	2E - External Walls	Replace Ironmongery
2 - Superstructure	2E - External Walls	Replace Sealed Glazed Units
2 - Superstructure	2E - External Walls	Aluminum Framed Double Glazed turn 5000 x 1400mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units

BCIS Structure		Element Description
2 - Superstructure	2F - Windows and External Doors	Aluminum Framed Double glazed units including access doors 5500mmx2500mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Aluminum Framed Double glazed units including access doors 35000mmx4800mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Aluminum Framed Double glazed units including access doors 12000mmx5000mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Aluminum Framed Double glazed units including access doors 4500mmx4000mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double Gazed tempered glazed powder coated with aluminum 2000mmx2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double Gazed tempered glazed powder coated with aluminum 1000mmx2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2C - Roof	Standing seam metal sheet roofing including insulation
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	Aluminum Brics Soleil detail over glass roofing (including glass roofing
2 - Superstructure	2C - Roof	Aluminum Brics Soleil detail over ?
2 - Superstructure	2C - Roof	Glass roofing over apartment
2 - Superstructure	2C - Roof	Replace Sealant
2 - Superstructure	2G - Internal Walls and Partitions	200mm Internal block work walls
2 - Superstructure	2G - Internal Walls	150mm Internal block work walls

BCIS Structure		Element Description
	and Partitions	
2 - Superstructure	2G - Internal Walls and Partitions	Aluminum framed double glazed wall units
2 - Superstructure	2G - Internal Walls and Partitions	Replace seals
2 - Superstructure	2G - Internal Walls and Partitions	Repair Allowance
2 - Superstructure	2G - Internal Walls and Partitions	Toilet cubical; 800x1800mm
2 - Superstructure	2G - Internal Walls and Partitions	Repair Allowance
2 - Superstructure	2G - Internal Walls and Partitions	Replace Ironmongery
2 - Superstructure	2G - Internal Walls and Partitions	Urinal cubical partitions
2 - Superstructure	2H - Internal Doors	Solid core wood stained w/closer; wood frame; including all ironmongery 2000x2100mm
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Solid core wood stained w/closer; wood frame; including all ironmongery 1000x2100mm
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Revolving door 3500mm dia 2400mm high
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Metal Folding door; 20 x 4m
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Wheel mounted Timber panel sliding doors including all ironmongery 15.5 x 4m
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Wheel mounted Timber panel sliding doors including all ironmongery 12 x 4m
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Wheel mounted Timber panel sliding doors including all ironmongery 14 x 4m
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Wheel mounted Timber panel sliding doors including all ironmongery 36 x 4m
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2D - Stairs	Concrete
2 - Superstructure	2D - Stairs	Form Work
2 - Superstructure	2D - Stairs	Reinforcement all diameters
2 - Superstructure	2D - Stairs	Balustrade
3 - Finishes	3A - Wall Finishes	Paint grade block work
3 - Finishes	3A - Wall Finishes	Fairfaced concrete finish
3 - Finishes	3A - Wall Finishes	Teak veneered ply on plasterboard
3 - Finishes	3A - Wall Finishes	Polished concrete walling
3 - Finishes	3A - Wall Finishes	Plastering to walls
3 - Finishes	3A - Wall Finishes	Semi gloss paint
3 - Finishes	3A - Wall Finishes	Repaint
3 - Finishes	3A - Wall Finishes	Ceramic tiles

BCIS Structure		Element Description
3 - Finishes	3B - Floor Finishes	Terrazzo tiling
3 - Finishes	3B - Floor Finishes	Power floated self finish exposed concrete slab
3 - Finishes	3B - Floor Finishes	Repair Allowance
3 - Finishes	3B - Floor Finishes	Ceramic tiles
3 - Finishes	3B - Floor Finishes	Polished concrete flooring
3 - Finishes	3B - Floor Finishes	Polished concrete flooring - external
3 - Finishes	3C - Ceiling Finishes	Fire rated plasterboards, self finished
3 - Finishes	3C - Ceiling Finishes	Repair Allowance
3 - Finishes	3C - Ceiling Finishes	Exposed truss with proprietary self finished line tray above
3 - Finishes	3C - Ceiling Finishes	Repair Allowance
3 - Finishes	3C - Ceiling Finishes	Teak veneered ply lining with service access
3 - Finishes	3C - Ceiling Finishes	Perforated metal service ceiling
3 - Finishes	3C - Ceiling Finishes	Semi gloss paint to plasterboard
3 - Finishes	3C - Ceiling Finishes	Repaint
5 - Mechanical and Electrical	5J - Lift Installations	Passenger elevator, two stops; 1000kg; 13 passenger capacity
5 - Mechanical and Electrical	5J - Lift Installations	Repair Allowance - lift car refurbishment
5 - Mechanical and Electrical	5J - Lift Installations	Repair Allowance - General equipment
5 - Mechanical and Electrical	5D - Water Installations	Domestic Water Distribution
5 - Mechanical and Electrical	5D - Water Installations	Replacement Allowance
5 - Mechanical and Electrical	5A - Sanitary Appliances	Sanitary Waste
5 - Mechanical and Electrical	5A - Sanitary Appliances	Replacement Allowance
5 - Mechanical and Electrical	5C - Disposal Installations	Rain Water Drainage
5 - Mechanical and Electrical	5C - Disposal Installations	Replacement Allowance
5 - Mechanical and Electrical	5C - Disposal Installations	Other Plumbing Systems
5 - Mechanical and Electrical	5C - Disposal Installations	Replacement Allowance
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Distribution System
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Replacement Allowance
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Terminal & Package Units - allowance for package replacement
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Replacement Allowance for terminal unit
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Controls & Instrumentation
5 - Mechanical and Electrical	5H - Electrical Installations	Electrical Services Distribution
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5H - Electrical Installations	Lighting & Branch Wiring

BCIS Structure		Element Description
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5L - Communication Installations	Communication & Security
5 - Mechanical and Electrical	5L - Communication Installations	Replacement Allowance
6 - Externals	6A - Site Works	Assumed minimal site clearance and level site
6 - Externals	6A - Site Works	Parking area consist width 200mm crushed stone sub-base, 60mm dense macadam road base and on top 40mm hot rolled asphalt (877 Nr parking spaces)
6 - Externals	6A - Site Works	Allowance for white lining
6 - Externals	6A - Site Works	Resurface Allowance
6 - Externals	6A - Site Works	Soft and hard landscaping including necessary irrigation works (parking area measured separately).
6 - Externals	6A - Site Works	Repair Allowance
6 - Externals	6A - Site Works	Fountain/ water feature; 4 x4m; including all mechanical works
6 - Externals	6A - Site Works	Repair Allowance
6 - Externals	6A - Site Works	General allowance for leveling

A one-bed apartment within a multi apartment complex

Clear cells indicate Component Replacement. Cells in grey indicate a Sub-Component Replacement.

BCIS Structure		Element Description
1 - Substructure	1 - Substructure	Concrete
1 - Substructure	1 - Substructure	Earth works
1 - Substructure	1 - Substructure	Form Work
1 - Substructure	1 - Substructure	Reinforcement
1 - Substructure	1 - Substructure	Waterproofing
1 - Substructure	1 - Substructure	Concrete; 200mm thick slab; including beams and columns
1 - Substructure	1 - Substructure	Fabric Reinforcement
1 - Substructure	1 - Substructure	Waterproofing/ DPM
2 - Superstructure	2B - Upper Floors	Concrete; 200mm thick.
2 - Superstructure	2B - Upper Floors	Form Work
2 - Superstructure	2B - Upper Floors	Reinforcement; all diameters
2 - Superstructure	2B - Upper Floors	Ribbed slab; 200mmx350mm at 1000c
2 - Superstructure	2C - Roof	Concrete; 200mm thick suspended
2 - Superstructure	2C - Roof	Form Work; to soffit of solid slab
2 - Superstructure	2C - Roof	Reinforcement; all diameters
2 - Superstructure	2E - External Walls	Block work walls; 200mm thick; insulated
2 - Superstructure	2E - External Walls	Yellow terracotta tiles; 300x600; to external block work walls
2 - Superstructure	2E - External Walls	Balustrade; 1.2m high
2 - Superstructure	2F - Windows and External Doors	Double glazed turn & tilt type 1200mmx1200mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed turn & tilt type 1200mmx1800mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed turn & tilt type 600mmx600mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed turn & tilt type 1200mmx1800mm; sliding

BCIS Structure		Element Description
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed tempered glazed with powder coated Aluminum 1000mmx2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed tempered glazed with powder coated Aluminum 1800mmx2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2C - Roof	Red roofing ceramic tiles
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	Roof waterproofing membrane
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	50mm Insulation
2 - Superstructure	2G - Internal Walls and Partitions	150mm Internal block work walls
2 - Superstructure	2H - Internal Doors	Solid core wood stained w/closer; wood frame; including all ironmongery
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2D - Stairs	Concrete
2 - Superstructure	2D - Stairs	Form Work
2 - Superstructure	2D - Stairs	Reinforcement; all diameters
3 - Finishes	3A - Wall Finishes	Plastering to walls
3 - Finishes	3A - Wall Finishes	Semi gloss paint
3 - Finishes	3A - Wall Finishes	Repaint
3 - Finishes	3A - Wall Finishes	Limestone brick finish to corridor, balcony and stair walls
3 - Finishes	3A - Wall Finishes	Repair Allowance
3 - Finishes	3A - Wall Finishes	Ceramic glossy tiles
3 - Finishes	3B - Floor Finishes	Terrazzo
3 - Finishes	3B - Floor Finishes	Ceramic; to toilet, kitchen and laundry areas
3 - Finishes	3C - Ceiling Finishes	Suspended metal ceiling
3 - Finishes	3C - Ceiling Finishes	Repair Allowance
3 - Finishes	3C - Ceiling Finishes	Gypsum ceiling including painting
3 - Finishes	3C - Ceiling Finishes	Repaint
5 - Mechanical and Electrical	5A - Sanitary Appliances	WC's floor type
5 - Mechanical and Electrical	5A - Sanitary Appliances	Bath tub (inc. shower rose)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Shower Cubicle
5 - Mechanical and Electrical	5A - Sanitary Appliances	Shower trays (inc. shower rose)

BCIS Structure		Element Description
5 - Mechanical and Electrical	5A - Sanitary Appliances	Wash basins (inc. taps)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Toilet paper holder
5 - Mechanical and Electrical	5A - Sanitary Appliances	Soap dish's
5 - Mechanical and Electrical	5A - Sanitary Appliances	Rope hook
5 - Mechanical and Electrical	5A - Sanitary Appliances	Countertop Kitchen Sink
5 - Mechanical and Electrical	5D - Water Installations	Domestic Water Distribution
5 - Mechanical and Electrical	5D - Water Installations	Replacement Allowance
5 - Mechanical and Electrical	5A - Sanitary Appliances	Sanitary Waste
5 - Mechanical and Electrical	5A - Sanitary Appliances	Replacement Allowance
5 - Mechanical and Electrical	5C - Disposal Installations	Rain Water Drainage
5 - Mechanical and Electrical	5C - Disposal Installations	Replacement Allowance
5 - Mechanical and Electrical	5C - Disposal Installations	Other Plumbing Systems
5 - Mechanical and Electrical	5C - Disposal Installations	Replacement Allowance
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Distribution System
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Replacement Allowance
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Terminal & Package Units
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Controls & Instrumentation
5 - Mechanical and Electrical	5H - Electrical Installations	Electrical Services Distribution
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5H - Electrical Installations	Lighting & Branch Wiring
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5L - Communication Installations	Communication & Security
5 - Mechanical and Electrical	5L - Communication Installations	Replacement Allowance
5 - Mechanical and Electrical	5A - Sanitary Appliances	Mirrors to bathrooms
4 - Fittings and Furnishings	4 - Fittings and Furnishings	Fit out of Kitchen area; all units, cabinets, sinks and associated ironmongery and accessories; 2Nr
4 - Fittings and Furnishings	4 - Fittings and Furnishings	Wardrobes including all associated ironmongery and accessories; 7Nr

BCIS Structure		Element Description
6 - Externals	6A - Site Works	Assumed minimal site clearance and level site
6 - Externals	6A - Site Works	Precast concrete interlocking pavers 100mmx200mm
6 - Externals	6A - Site Works	Repair Allowance
6 - Externals	6A - Site Works	Pedestrian Paving
6 - Externals	6A - Site Works	Repair Allowance
6 - Externals	6A - Site Works	125Nr shade canopy tree, 20 Nr palm, 56Nr flowering accent tree, 480m hedge, 8032m2 lawn, 2108m2 ground cover
8 - Externals	6D - Minor Building Works	Earth works
8 - Externals	6D - Minor Building Works	Concrete
8 - Externals	6D - Minor Building Works	Form Work
8 - Externals	6D - Minor Building Works	Reinforcement
8 - Externals	6D - Minor Building Works	Waterproofing
8 - Externals	6D - Minor Building Works	Exterior Walls
8 - Externals	6D - Minor Building Works	Repointing
8 - Externals	6D - Minor Building Works	Exterior Windows: Double glazed, operable turn and tiled windows 1000mmx1200mm
8 - Externals	6D - Minor Building Works	Replace Seals
8 - Externals	6D - Minor Building Works	Replace Ironmongery
8 - Externals	6D - Minor Building Works	Replace Sealed Glazed Units
8 - Externals	6D - Minor Building Works	Exterior Doors; Solid core wood stained w/closer; wood frame; including all ironmongery 1050mmx2100mm
8 - Externals	6D - Minor Building Works	Replace Ironmongery
8 - Externals	6D - Minor Building Works	Wall finishes; Plastered walls; semi gloss paint
8 - Externals	6D - Minor Building Works	Repaint
8 - Externals	6D - Minor Building Works	Ceramic Tiles
8 - Externals	6D - Minor Building Works	Floor Finish - Terrazzo
8 - Externals	6D - Minor Building Works	Floor Finish - Ceramic tiles for pool
8 - Externals	6D - Minor Building Works	Floor Finish - Ceramic Tiles for pool deck
8 - Externals	6D - Minor Building Works	Floor Finish - Ceramic Tiles for pool s and WC
8 - Externals	6D - Minor Building Works	Ceiling Finishes - Suspended Metal Ceiling
8 - Externals	6D - Minor Building Works	Repair Allowance
8 - Externals	6D - Minor Building Works	Equipment; Water treatment/filtration, sterilizer dosing
8 - Externals	6D - Minor Building Works	Replacement allowance

A High Quality House

Clear cells indicate Component Replacement. Cells in grey indicate a Sub-Component Replacement.

BCIS Structure		Element Description
1 - Substructure	1 - Substructure	Concrete
1 - Substructure	1 - Substructure	Earth works
1 - Substructure	1 - Substructure	Form Work
1 - Substructure	1 - Substructure	Reinforcement
1 - Substructure	1 - Substructure	Waterproofing
1 - Substructure	1 - Substructure	Concrete; 200mm thick slab; including beams and columns
1 - Substructure	1 - Substructure	Fabric Reinforcement
1 - Substructure	1 - Substructure	Waterproofing/ DPM
2 - Superstructure	2B - Upper Floors	Concrete; 200mm thick.
2 - Superstructure	2B - Upper Floors	Form Work
2 - Superstructure	2B - Upper Floors	Reinforcement; all diameters
2 - Superstructure	2C - Roof	Concrete; 200mm thick suspended
2 - Superstructure	2C - Roof	Form Work; to soffit of solid slab
2 - Superstructure	2C - Roof	Reinforcement; all diameters
2 - Superstructure	2E - External Walls	Block work walls; 200mm thick; insulated
2 - Superstructure	2E - External Walls	Yellow terracotta tiles; 300x600; to external block work walls
2 - Superstructure	2E - External Walls	Repair Allowance
2 - Superstructure	2E - External Walls	Aluminum frame with double tinted tempered glazing; including door; to veranda
2 - Superstructure	2E - External Walls	Replace Seals
2 - Superstructure	2E - External Walls	Replace Ironmongery
2 - Superstructure	2E - External Walls	Replace Sealed Glazed Units
2 - Superstructure	2E - External Walls	Balustrade; 1.2m high
2 - Superstructure	2F - Windows and External Doors	Double glazed turn & tilt type 1200mmx1200mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed turn & tilt type 1200mmx1800mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed turn & tilt type 600mmx600mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery

BCIS Structure		Element Description
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed turn & tilt type 1200mmx1800mm; sliding
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Solid core hardwood veneer door; 2000mmx 2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Double glazed tempered glazed with powder coated Aluminum 1000mmx2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2C - Roof	Red roofing ceramic tiles
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	Roof waterproofing membrane
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	50mm Insulation
2 - Superstructure	2C - Roof	Roof, translucent layer with aluminum frame; to veranda
2 - Superstructure	2C - Roof	Replace Seals
2 - Superstructure	2C - Roof	Replace Ironmongery
2 - Superstructure	2C - Roof	Replace Sealed Glazed Units
2 - Superstructure	2G - Internal Walls and Partitions	150mm Internal block work walls
2 - Superstructure	2H - Internal Doors	Solid core wood stained w/closer; wood frame; including all ironmongery
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2D - Stairs	Concrete
2 - Superstructure	2D - Stairs	Form Work
2 - Superstructure	2D - Stairs	Reinforcement; all diameters
3 - Finishes	3A - Wall Finishes	Plastering to walls
3 - Finishes	3A - Wall Finishes	Semi gloss paint
3 - Finishes	3A - Wall Finishes	Repaint
3 - Finishes	3A - Wall Finishes	Ceramic tiles
3 - Finishes	3B - Floor Finishes	Terrazzo
3 - Finishes	3B - Floor Finishes	Marble
3 - Finishes	3B - Floor Finishes	Ceramic; to toilet, kitchen and laundry areas
3 - Finishes	3C - Ceiling Finishes	Suspended metal ceiling
3 - Finishes	3C - Ceiling Finishes	Repair Allowance
3 - Finishes	3C - Ceiling Finishes	Gypsum ceiling including painting
3 - Finishes	3C - Ceiling Finishes	Painting to ceiling
5 - Mechanical and Electrical	5A - Sanitary Appliances	WC's floor type
5 - Mechanical and Electrical	5A - Sanitary Appliances	Bath tub (inc. shower rose)
5 - Mechanical and	5A - Sanitary	Shower trays (inc. shower rose)

BCIS Structure		Element Description
Electrical	Appliances	
5 - Mechanical and Electrical	5A - Sanitary Appliances	Wash basins (inc. taps)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Toilet paper holder
5 - Mechanical and Electrical	5A - Sanitary Appliances	Soap dish's
5 - Mechanical and Electrical	5A - Sanitary Appliances	Rope hook
5 - Mechanical and Electrical	5D - Water Installations	Domestic Water Distribution
5 - Mechanical and Electrical	5D - Water Installations	Replacement Allowance
5 - Mechanical and Electrical	5A - Sanitary Appliances	Sanitary Waste
5 - Mechanical and Electrical	5A - Sanitary Appliances	Replacement Allowance
5 - Mechanical and Electrical	5C - Disposal Installations	Rain Water Drainage
5 - Mechanical and Electrical	5C - Disposal Installations	Replacement Allowance
5 - Mechanical and Electrical	5C - Disposal Installations	Other Plumbing Systems
5 - Mechanical and Electrical	5C - Disposal Installations	Replacement Allowance
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Distribution System
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Replacement Allowance
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Terminal & Package Units
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Controls & Instrumentation
5 - Mechanical and Electrical	5H - Electrical Installations	Electrical Services Distribution
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5H - Electrical Installations	Lighting & Branch Wiring
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance - Lighting
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance - Wiring
5 - Mechanical and Electrical	5L - Communication Installations	Communication & Security
5 - Mechanical and Electrical	5L - Communication Installations	Replacement Allowance
5 - Mechanical and Electrical	5A - Sanitary Appliances	Mirrors to bathrooms
4 - Fittings and Furnishings	4 - Fittings and Furnishings	Fit out of Kitchen area; all units, cabinets, sinks and associated ironmongery and accessories; 2Nr
4 - Fittings and Furnishings	4 - Fittings and Furnishings	Wardrobes including all associated ironmongery and accessories; 7Nr
6 - Externals	6A - Site Works	Assumed minimal site clearance and level site

BCIS Structure		Element Description
6 - Externals	6A - Site Works	Interlocking paving; tile paving, lawn; shade canopy trees, palm trees, flowering accent; hedging; perimeter wall; all as per landscaping drawing
6 - Externals	6A - Site Works	Pool incl decking
6 - Externals	6A - Site Works	Walling
6 - Externals	6A - Site Works	Landscaping
6 - Externals	6A - Site Works	Tile paving
6 - Externals	6A - Site Works	1900mm high stone wall to plot perimeter, including gate access
8 - Externals	6D - Minor Building Works	Earthworks, Pool
8 - Externals	6D - Minor Building Works	Concrete, Pool
8 - Externals	6D - Minor Building Works	Form Work, Pool
8 - Externals	6D - Minor Building Works	Reinforcement, Pool
8 - Externals	6D - Minor Building Works	Waterproofing, Pool
8 - Externals	6D - Minor Building Works	Ceramic tiles to pool, Pool, Floor
8 - Externals	6D - Minor Building Works	Ceramic tiles to pool, Pool, Wall
8 - Externals	6D - Minor Building Works	Ceramic tiles to pool deck, Pool
8 - Externals	6D - Minor Building Works	Water treatment/filtration, sterilizer dosing
8 - Externals	6D - Minor Building Works	Replacement Allowance

Golf Clubhouse and Maintenance Building

Clear cells indicate Component Replacement. Cells in grey indicate a Sub-Component Replacement.

BCIS Structure		Element Description
1 - Substructure	1 - Substructure	Concrete
1 - Substructure	1 - Substructure	Earth works
1 - Substructure	1 - Substructure	Form Work
1 - Substructure	1 - Substructure	Reinforcement
1 - Substructure	1 - Substructure	Waterproofing
1 - Substructure	1 - Substructure	Concrete; 200mm thick floor slab
1 - Substructure	1 - Substructure	Concrete; 100mm thick floor slab
1 - Substructure	1 - Substructure	Fabric Reinforcement
1 - Substructure	1 - Substructure	Waterproofing/ DPM
2 - Superstructure	2B - Upper Floors	Concrete; 300mm thick.
2 - Superstructure	2B - Upper Floors	Concrete 180mm thick
2 - Superstructure	2B - Upper Floors	Concrete columns beams and walls
2 - Superstructure	2B - Upper Floors	Form Work
2 - Superstructure	2B - Upper Floors	Reinforcement; all diameters
2 - Superstructure	2B - Upper Floors	Steel columns, 200x100mm
2 - Superstructure	2B - Upper Floors	Solid oak timber decking
2 - Superstructure	2C - Roof	Steel beams
2 - Superstructure	2C - Roof	Concrete 180mm thick suspended
2 - Superstructure	2C - Roof	Concrete beams
2 - Superstructure	2C - Roof	Form Work
2 - Superstructure	2C - Roof	Reinforcement; all diameters
2 - Superstructure	2C - Roof	Timber louvered canopy set within vertical and horizontal steel supports
2 - Superstructure	2E - External Walls	200mm insitu concrete walling with Portland white
2 - Superstructure	2E - External Walls	200mm Blockwork Walls
2 - Superstructure	2E - External Walls	Double glass frameless wall
2 - Superstructure	2E - External Walls	Repair Allowance
2 - Superstructure	2E - External Walls	Block work walls; 400mm thick; insulated
2 - Superstructure	2E - External Walls	Cast Stone Cladding
2 - Superstructure	2E - External Walls	Yellow terracotta tiles; 300x600; to external blockwork walls (sannini system)
2 - Superstructure	2E - External Walls	Repair Allowance
2 - Superstructure	2E - External Walls	Galvanized MS railing and balustrades
2 - Superstructure	2E - External Walls	Repair Allowance
2 - Superstructure	2E - External Walls	Steel framed bridge with concrete deck at the entrance including, 17m handrails and balustrades, timber louvered
2 - Superstructure	2E - External Walls	Repair Allowance
2 - Superstructure	2F - Windows and External Doors	Proprietary double glazed aluminum framed windows including ironmongery 3400x3000mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units

BCIS Structure		Element Description
2 - Superstructure	2F - Windows and External Doors	Proprietary double glazed aluminum framed windows including ironmongery 8200x3000mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Proprietary double glazed aluminum framed windows including ironmongery 4800x1500mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Proprietary double glazed aluminum framed windows including ironmongery 4400x3000mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Proprietary double glazed aluminum framed windows including ironmongery 4600x3000mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Proprietary double glazed aluminum framed windows including ironmongery 2200x3000mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Proprietary double glazed aluminum framed windows including ironmongery 5600x3000mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Proprietary double glazed aluminum framed windows including ironmongery 3800x3000mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Proprietary double glazed aluminum framed windows including ironmongery 2600x3000mm

BCIS Structure		Element Description
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Proprietary double glazed aluminum framed windows including ironmongery 600x1800mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Proprietary double glazed aluminum framed windows including ironmongery 600x1200mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Proprietary double glazed aluminum framed windows including ironmongery 6200x2200mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Proprietary double glazed aluminum framed windows including ironmongery 3600x2200mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Proprietary double glazed aluminum framed windows including ironmongery 2400x1200mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Proprietary double glazed aluminum framed windows including ironmongery 1200x600mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed turn and tilt type inc. frame and ironmongery 2500mmx2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals

BCIS Structure		Element Description
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Double glazed turn and tilt type inc. frame and ironmongery 1000mmx700mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Proprietary aluminum double glazed units, 2000x3000mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Proprietary aluminum double glazed units, 1000x3000mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Solid core timber, beech veneer, self closure, 1000x2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Steel Doors with Closer 1000mmx2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	10mm thick tempered glass with powder coated Al frame 2000mmx2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Solid wood stained door with self closer including ironmongery 1500mmx2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery

BCIS Structure		Element Description
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Steel sliding doors including ironmongery 6000mmx2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2F - Windows and External Doors	Steel sliding doors including ironmongery 4000mm2100mm
2 - Superstructure	2F - Windows and External Doors	Replace Seals
2 - Superstructure	2F - Windows and External Doors	Replace Ironmongery
2 - Superstructure	2F - Windows and External Doors	Replace Sealed Glazed Units
2 - Superstructure	2C - Roof	Standing seam metal roofing system
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	Roof waterproofing membrane
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	50mm Insulation
2 - Superstructure	2C - Roof	Red Roofing Ceramic Tiles
2 - Superstructure	2C - Roof	Repair Allowance
2 - Superstructure	2C - Roof	Aluminum frame with double tinted tempered glazing covered on the roof by translucent layer, to veranda
2 - Superstructure	2G - Internal Walls and Partitions	400mm Internal block work walls
2 - Superstructure	2G - Internal Walls and Partitions	200mm Internal block work walls
2 - Superstructure	2G - Internal Walls and Partitions	100mm Internal blockwork walls
2 - Superstructure	2H - Internal Doors	Solid core timber, beech veneer, self closure, including ironmongery 1000x2100mm
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Solid core timber, beech veneer, self closure, including ironmongery 2000x2100mm
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Toughened frameless glass doors 1800x3000mm
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Solid core, timber vencered door; wood frame; including all ironmongery 900x2100mm
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Solid core, timber vencered door; wood frame; including all ironmongery 1500x2100mm
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Steel Door with Closer 3000mmx2100mm
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Steel Door with Closer 1000mmx2100mm
2 - Superstructure	2H - Internal Doors	Replacement Allowance

BCIS Structure		Element Description
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2H - Internal Doors	Steel Door with Closer 900mmx2100mm
2 - Superstructure	2H - Internal Doors	Replacement Allowance
2 - Superstructure	2H - Internal Doors	Replace Ironmongery
2 - Superstructure	2D - Stairs	Concrete
2 - Superstructure	2D - Stairs	Form Work
2 - Superstructure	2D - Stairs	Reinforcement; all diameters
2 - Superstructure	2D - Stairs	Handrailing and Balustrades
2 - Superstructure	2D - Stairs	Repair Allowance
3 - Finishes	3A - Wall Finishes	Plastering to walls
3 - Finishes	3A - Wall Finishes	Semi gloss paint
3 - Finishes	3A - Wall Finishes	Repaint
3 - Finishes	3A - Wall Finishes	Ceramic tiles
2 - Superstructure	2C - Roof	Self finish dense concrete
2 - Superstructure	2C - Roof	Oil paint over cement sand plaster
3 - Finishes	3A - Wall Finishes	Teak Veneered ply lining on block wall
3 - Finishes	3A - Wall Finishes	Repair Allowance
3 - Finishes	3A - Wall Finishes	Painted Grade Blockwork
3 - Finishes	3A - Wall Finishes	Repaint
3 - Finishes	3A - Wall Finishes	Altro white rock hygienic pvc sheeting
3 - Finishes	3B - Floor Finishes	Terrazzo tile flooring
3 - Finishes	3B - Floor Finishes	Terrazzo tile flooring
3 - Finishes	3B - Floor Finishes	Self finish concrete
3 - Finishes	3B - Floor Finishes	Ceramic tiles on solid floors
3 - Finishes	3B - Floor Finishes	Epoxy coating with primer over plain concrete
3 - Finishes	3B - Floor Finishes	Coating
3 - Finishes	3B - Floor Finishes	Steel grating over chemical high resistance epoxy coating
3 - Finishes	3B - Floor Finishes	Carpet over terrazzo
3 - Finishes	3B - Floor Finishes	Exposed concrete slabs
3 - Finishes	3B - Floor Finishes	Beech HW (Junkers Duo-Batt) spring sports flooring
3 - Finishes	3B - Floor Finishes	Repair Allowance
3 - Finishes	3B - Floor Finishes	Heavy grade contract barrier matting carpet
3 - Finishes	3C - Ceiling Finishes	Painted plasterboard with service access hatch, feature ceiling
3 - Finishes	3C - Ceiling Finishes	Repainting to ceiling
3 - Finishes	3C - Ceiling Finishes	Perforated metal service ceiling
3 - Finishes	3C - Ceiling Finishes	Repair Allowance
3 - Finishes	3C - Ceiling Finishes	Teak veneered ply lining with service access hatch, feature ceiling
3 - Finishes	3C - Ceiling Finishes	Repair Allowance
3 - Finishes	3C - Ceiling Finishes	Suspended metal ceiling
3 - Finishes	3C - Ceiling Finishes	Repair Allowance
3 - Finishes	3C - Ceiling Finishes	Gypsum ceiling including painting
3 - Finishes	3C - Ceiling Finishes	Painting to ceiling
3 - Finishes	3C - Ceiling Finishes	Self finish concrete
5 - Mechanical and Electrical	5A - Sanitary Appliances	WC's floor type
5 - Mechanical and Electrical	5A - Sanitary Appliances	WC's floor type
5 - Mechanical and Electrical	5A - Sanitary Appliances	Bath tub (inc. shower rose)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Shower trays (inc. shower rose)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Wash basins (inc. taps)

BCIS Structure		Element Description
5 - Mechanical and Electrical	5A - Sanitary Appliances	Wash basins (inc. taps)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Wash basins with tap (inc 3000mm length size vanity top)
5 - Mechanical and Electrical	5A - Sanitary Appliances	Grab Rails
5 - Mechanical and Electrical	5A - Sanitary Appliances	Toilet paper holder
5 - Mechanical and Electrical	5A - Sanitary Appliances	Soap dish's
5 - Mechanical and Electrical	5A - Sanitary Appliances	Mirrors
5 - Mechanical and Electrical	5A - Sanitary Appliances	Mirrors - 800mmx800mm
5 - Mechanical and Electrical	5A - Sanitary Appliances	Tissue dispenser
5 - Mechanical and Electrical	5A - Sanitary Appliances	Hand dryer
5 - Mechanical and Electrical	5A - Sanitary Appliances	Urinals
5 - Mechanical and Electrical	5D - Water Installations	Domestic Water Distribution
5 - Mechanical and Electrical	5D - Water Installations	**Replacement Allowance**
5 - Mechanical and Electrical	5A - Sanitary Appliances	Sanitary Waste
5 - Mechanical and Electrical	5A - Sanitary Appliances	**Replacement Allowance**
5 - Mechanical and Electrical	5C - Disposal Installations	Rain Water Drainage
5 - Mechanical and Electrical	5C - Disposal Installations	**Replacement Allowance**
5 - Mechanical and Electrical	5C - Disposal Installations	Other Plumbing Systems
5 - Mechanical and Electrical	5C - Disposal Installations	**Replacement Allowance**
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Distribution System
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	**Replacement Allowance**
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Terminal & Package Units - allowance for package replacement
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	**Replacement Allowance for terminal unit**
5 - Mechanical and Electrical	5F - Space Heating and Air Treatment/5G - Ventilation Systems	Controls & Instrumentation
5 - Mechanical and Electrical	5H - Electrical Installations	Electrical Services Distribution
5 - Mechanical and Electrical	5H - Electrical Installations	**Replacement Allowance**
5 - Mechanical and Electrical	5H - Electrical Installations	Electrical Services Distribution
5 - Mechanical and	5H - Electrical	**Replacement Allowance**

BCIS Structure		Element Description
Electrical	Installations	
5 - Mechanical and Electrical	5H - Electrical Installations	Lighting & Branch Wiring
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5H - Electrical Installations	Lighting & Branch Wiring
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5H - Electrical Installations	Replacement Allowance
5 - Mechanical and Electrical	5L - Communication Installations	Communication & Security
5 - Mechanical and Electrical	5L - Communication Installations	Replacement Allowance
5 - Mechanical and Electrical	5L - Communication Installations	Communication & Security
5 - Mechanical and Electrical	5L - Communication Installations	Replacement Allowance
4 - Fittings and Furnishings	4 - Fittings and Furnishings	Changing Cubicles 1600x1200mm
4 - Fittings and Furnishings	4 - Fittings and Furnishings	Repair Allowance
4 - Fittings and Furnishings	4 - Fittings and Furnishings	Changing Cubicles 1400x1200mm
4 - Fittings and Furnishings	4 - Fittings and Furnishings	Repair Allowance
4 - Fittings and Furnishings	4 - Fittings and Furnishings	Changing Cubicles 1400x1400mm
4 - Fittings and Furnishings	4 - Fittings and Furnishings	Repair Allowance
4 - Fittings and Furnishings	4 - Fittings and Furnishings	Changing Cubicles 1000x1800mm
4 - Fittings and Furnishings	4 - Fittings and Furnishings	Repair Allowance
4 - Fittings and Furnishings	4 - Fittings and Furnishings	Fit out of kitchen area; all units and associated ironmongery and accessories (3 Nos)
4 - Fittings and Furnishings	4 - Fittings and Furnishings	Central Reception Desk
6 - Externals	6A - Site Works	Assumed minimal site clearance and level site
8 - Externals	6D - Minor Building Works	Water tank - excavation
8 - Externals	6D - Minor Building Works	Water tank - Concrete
8 - Externals	6D - Minor Building Works	Water tank - Formwork
8 - Externals	6D - Minor Building Works	Water tank - Reinforcement (all diameters)
8 - Externals	6D - Minor Building Works	Water tanks - waterproofing
8 - Externals	6D - Minor Building Works	Water tanks - water stops
8 - Externals	6D - Minor Building Works	Water tanks - precast items - 200mm thick removable slab
8 - Externals	6D - Minor Building Works	Water tanks - 1200x1200x1000 stairs (4steps)